THE EFFECTIVENESS OF THE MANN INVENTORY IN CLASSIFYING YOUNG DRIVERS INTO BEHAVIORAL CATEGORIES AND ITS RELATIONSHIP TO SUBSEQUENT DRIVER PERFORMANCE

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THESIS



This is to certify that the

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presented by

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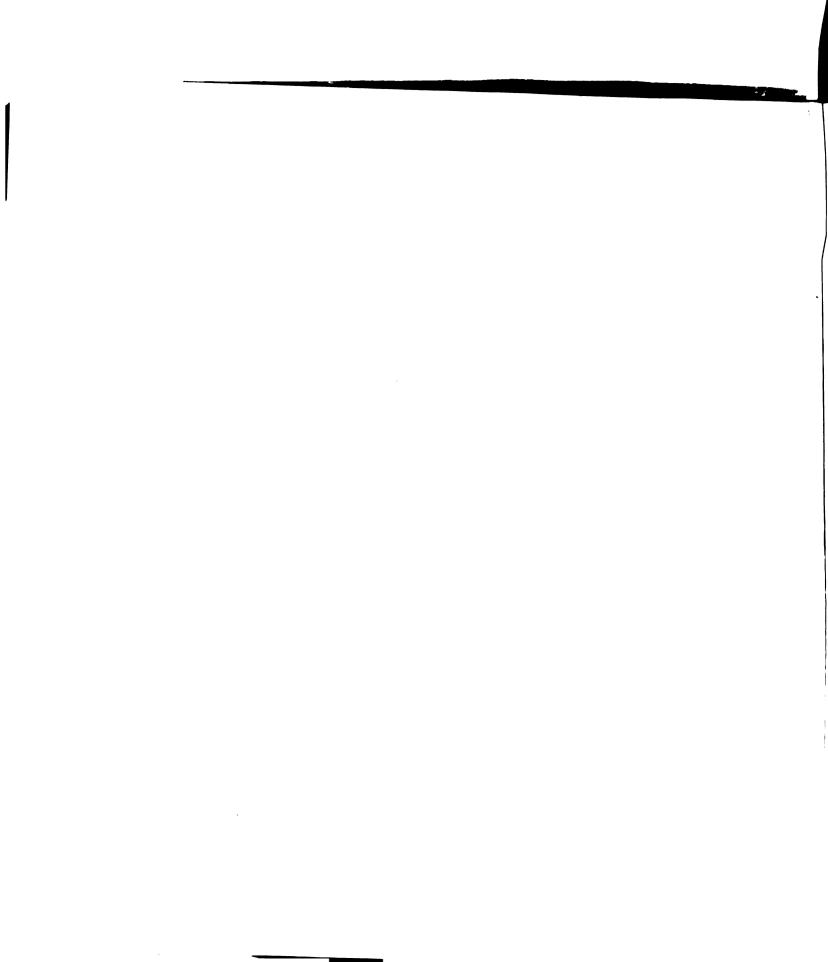
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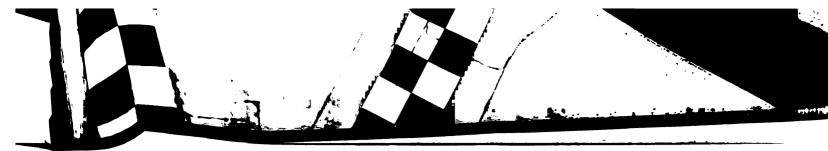
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ABSTRACT

THE EFFECTIVENESS OF THE MANN INVENTORY IN CLASSIFYING YOUNG DRIVERS INTO BEHAVIORAL CATEGORIES AND ITS RELATIONSHIP TO SUBSEQUENT DRIVER PERFORMANCE

by Francis Carl Kenel

Previous studies investigating the causes of motor vehicle accidents almost invariably demonstrate that most are attributable to human failures of various kinds. In recent years the area of personality factors, attitudes, and the quality of personal adjustment, "We drive as we live," has been emphasized as important to safe driving.

The primary purpose of this study was to investigate the validity and reliability of the Mann Inventory.

The Mann Inventory consists of 63 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.

An effort was made to ascertain whether or not persons classified into one of six behavioral categories on the basis of observed behavior would respond differently to items in the Mann Inventory.

The secondary purpose of the study was to ascertain whether or not the observed behavior which identified an individual within a behavioral category would be reflected in subsequent driving record.

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Sexton High School, Lansing, Michigan, was selected for this investigation on the basis of:

- 1. A student body of approximately 2000, representing a broad cross-section of the population.
- A Driver Education program reaching several hundred students each year.

The sample population of this study consists of 1057 subjects, 523 males and 534 females who were enrolled in, and had satisfactorily completed Driver Education at Sexton High School, Lansing, Michigan, between September, 1958 and June, 1960.

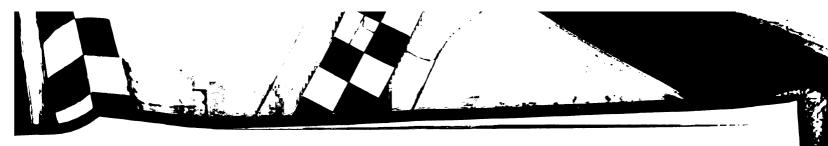
 Availability of comprehensive and professional police Traffic Record Files.

All students enrolled in the Driver Education program completed the Mann Inventory during the last week of the Driver Education course. On the basis of rater observation, conducted throughout the semester, each rater placed the individual Inventory response sheet into one of the six appropriate behavioral categories.

The hypotheses were tested by means of Chi Square,
The Cell Square Contingency Method and Product-Moment
Correlation.

Statistical analysis of the data reveals:

1. When students were grouped on the basis of observed behavior, response to items in the Mann Inventory were significantly different for each behavioral category. Sixty of the 63 items were significant at or above the .10 level of confidence for the sample population.



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The response to items with the sample population divided by sex reveals 37 items that differentiate significantly for females and 47 items for males at or above the .10 level of confidence. Response to 20 to 39 specific items were identified with any one of the six behavioral categories.

- 2. The reliability of the Mann Inventory was determined by application of Product-Moment coefficient of correlation to two separate administrations of the instrument. Correlation values of .697 .986 were derived. With 63 degrees of freedom, these values indicate a high to very high correlation with marked or dependable relationships.
- 3. The relationship between the behavioral categories and driving records was of the same direction and magnitude as was the relationship between the Mann Inventory and observed behavior. As the individuals behavior deviated from category 1 (well adjusted), toward category 6 (marked evidence of problems of adjustment in school), his driving record of convictions and/or collisions increased.



THE EFFECTIVENESS OF THE MANN INVENTORY IN CLASSIFYING
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Ву

Francis Carl Kenel

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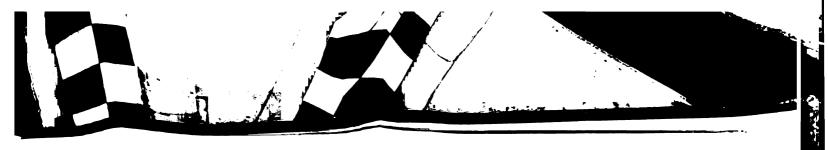
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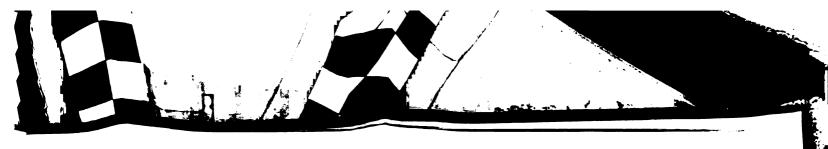


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CHAPTER I

THE PROBLEM

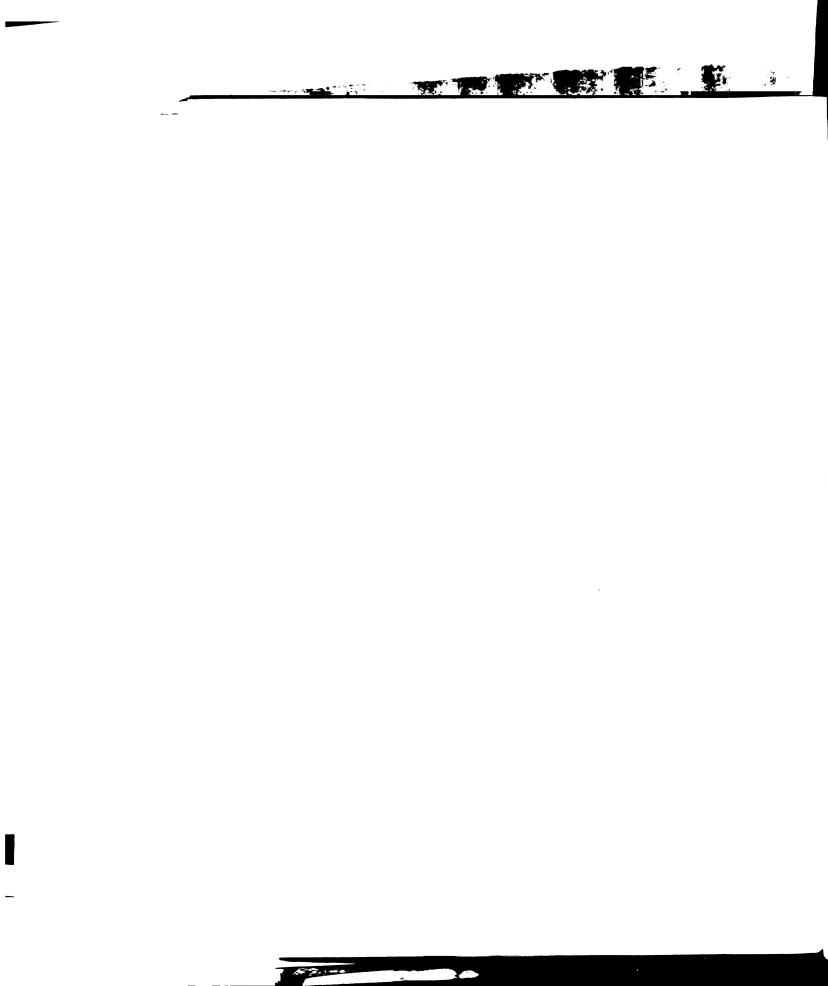
Identification of the unique characteristics of the problem driver has been the subject of numerous investigations employing a variety of approaches. Research efforts have encompassed categories of sensory and motor skills, age, intelligence, personal credit rating, social adjustment, emotional stability and personality factors, or combinations of these and several other variables.

In reference to physical characteristics, the Eno study, 1 Cobb, 2 and Fletcher, 3 have shown slight but positive relationship between static visual acuity and

^{1&}quot;Personal Characteristics of Traffic-Accident Repeaters," Eno Foundation for Highway Traffic Control, Saugatuck, Conn., 1948, pp. 64.

²P. W. Cobb, "Automobile Driver Tests Administered to 3,663 Persons in Connecticut, 1936-37, and the Relation of the Test Scores to the Accident Sustained," Unpublished Report to Highway Research Board, Washington, D. C., July, 1939.

³E. D. Fletcher, "Visual Acuity and Safe Driving Ability," <u>Journal of the American Optometric Association</u>, XX, 7 (1949), pp. 439-442.



driving record. Burg, 4 in an investigation of dynamic visual acuity, static visual acuity, and driving record reports a somewhat stronger relationship between dynamic visual acuity and driving record than between static visual acuity and driving record.

Finesilver⁵ reports no apparent relationship between auditory sensitivity and subsequent or prior driving record.

Cobb⁶ and Lauer⁷ report low correlations between motor skills and driving record. Lauer⁸ and Marsh⁹ demonstrate a positive relationship between age, (identified as under 25 and over 65), as a characteristic related to disproportionate accident involvement. However, other research indicates that the age differential is incidental

Albert Burg, "An Investigation of Some Relationships Between Dynamic Visual Acuity, Static Visual Acuity and Driving Record," University of California, Department of Engineering, April, 1964.

⁵S. G. Finesilver, "National Symposium of the Deaf; Driving and Employability," University of Denver, College of Law, February 12-14, 1962.

⁶Cobb, op. cit.

⁷A. R. Lauer <u>et al.</u>, "Aptitude Tests for Army Motor Vehicle Operators," Report 981, Personnel Research Section, TAGO, Department of Army, Washington, D. C., 1952.

⁸A. R. Lauer, "Age and Sex in Relation to Accidents," Bulletin 60, Highway Research Board, 1952.

⁹B. W. Marsh, "Aging and Driving," <u>Traffic</u> Engineering Reprint, November, 1960.



and that the personality and behavior patterns of these age groups are the real variables.

While no direct relationship between intelligence and accident involvement can be readily identified, Kremple, 10 reports that persons with ten or more years of formal education tend to be less susceptible to accidents than those with fewer years of education. Birnbach 11 in using intelligence as one criterion, reports no difference in the average intelligence rating of either the accident repeater or the accident-free group. The accident-free group, however, appears to possess greater knowledge and understanding of safety concepts than do the repeaters.

Tillman and Hobbs¹² using residence, age and sex as control factors, submitted the names and addresses of 96 male drivers who had experienced four or more collisions and a control group of 100 accident-free drivers to

¹⁰R. J. Kremple, "A Study of Application Blank Items to Discover Those Differentiating Accident-Free from Accident-Prone Truck Drivers" (unpublished Master's dissertation, Western Reserve University, Cleveland, Ohio, 1951).

¹¹S. B. Birnbach, "A Comparative Study of Accident Repeater and Accident-Free Pupils" (unpublished Doctoral dissertation, New York University, 1947).

¹²W. A. Tillman and G. E. Hobbs, "The Accident Prone Automobile Driver," A Study of Psychiatric and Social Background, American Journal of Psychiatry, CVI, 5 (1949), pp. 321-331.

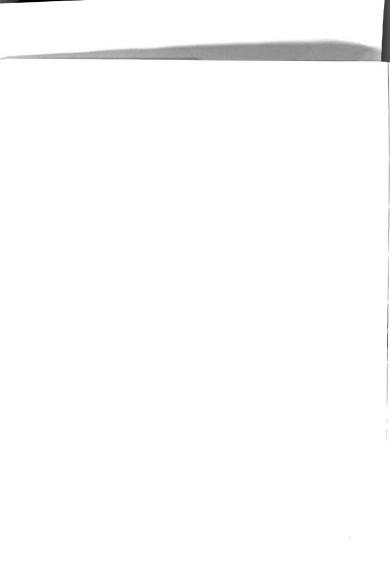
Juvenile court, adult court for records other than automobile accidents, public health agencies, venereal disease clinics, local credit bureau and three other social agencies. Their findings revealed that 66 per cent of the high accident group were known to one or more agencies; while among the control group, only nine were known to any one of the agencies and in no instance was one of these persons known to more than one agency.

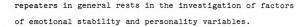
Heath¹³ in a comparative study employing personal data and the Thurston Temperment Schedule reports that of 763 traffic offenders who had a record of at least three offenses and a control group of 195 subjects who had a record of no accidents or violations that the repeaters scored much higher in the area of impulsiveness and on the social scales. He concludes, therefore, that emotional factors were the major determinants of one's driving record. In summary, Brody¹⁴ indicates that safe, lawful, courteous driving is primarily a problem of emotional makeup and social adequacy.

It appears then that the greatest potential for the identification or prediction of problem drivers or accident

¹³E. D. Heath, "The Relationships Between Driving Records, Selected Personality Characteristics, and Biographical Data of Traffic Offenders and Nonoffenders," The Traffic Safety Library, Illinois State University.

¹⁴ Leon Brody, "Personal Characteristics of Chronic Violators and Accident Repeaters," <u>Highway Research</u> <u>Board</u>, Bulletin No. 152, National Academy of Sciences, National Research Council.





Statement of the Problem

The primary purpose of this study is to investigate the validity and reliability of the <u>Mann Inventory</u>, (hereafter referred to as the M. I. or the "Inventory,") as an objective measure of selected behavioral categories.

The secondary purpose of the investigation is to determine the relationship, if any, between the several categories and subsequent accrued driving record—collisions and/or convictions for moving violations.

Importance of the Problem

Death and injuries resulting from motor vehicle mishaps have risen steadily since the late 1950's. In spite of improvements in highway and vehicle design, increased enforcement and educational effort, and continuous exhortation in both newsprint and other mass media to drive carefully, approximately 50,000 fatalities and 1 3/4 million injuries are experienced annually. This fact becomes even more significant when one realizes that the death rate per 100 million miles driven has increased from 5.2 in 1961 to 5.7 in 1964, and the rate per 100,000 population has risen from 21.3 in 1958 to 24.9 in 1964. 15

¹⁵ Accident Facts, 1965 edition, National Safety Council, Statistics Division, p. 59.

Studies investigating the causes of motor vehicle accidents almost invariably demonstrate that most are attributable to human failures of various kinds. In recent years the area of personality variables, attitudes, and the quality of personal adjustment has been emphasized as important to safe driving. An especially promising approach can be summarized by, "We drive as we live, and high accident rates may reflect our patterns of adjustment to modern life. Also, the attitudes and values held by accident repeaters appear to differ from those of safe drivers." 16

If we accept as significant indicators those personality characteristics most frequently identified among accident repeaters, it appears that they are basically emotionally and socially maladjusted and resentful of authority. To a somewhat lesser degree they lack self-discipline, have an irregular job history, are immature in their thinking and planning for the future, and have had an over-authoritative mother or father or parent figure. Possibly another indication of social-emotional maladjustment is evidence of an uncooperative attitude.

Assuming that one or a combination of these characteristics identifies the potential traffic violator-accident involvee/or accident repeater, then a major

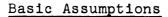
Ross A. McFarland, <u>The Major Strategies in the Prevention of Highway Injuries and Fatalities</u>, Harvard School of Public Health, pp. 3-4.

consideration appears to be the need for the development of some method to identify him before an accident pattern develops. Credence is given to the possibility of such a procedure by Brazell, 17 when he reports that "significantly higher percentages of students who received low attitude grades in driver education courses had accidents and moving violations than did students who received high attitude grades." (The above attitudinal grade was based on teacher evaluation of student behavior.)

Further evidence tends to indicate that it is possible to identify a certain percentage of the extreme accident repeaters or traffic violators out of a total test group by using various paper and pencil instruments, plus interview techniques and/or case studies. However, with the possible exception of the Psychological Inventory developed by Dr. Charles F. Hanner, 18 there does not appear to be any single instrument or method that can be administered to an individual that will justify concluding that he will be involved in accidents, although it may be stated that he possesses many characteristics that indicate a propensity toward accident susceptibility.

¹⁷ Robert E. Brazell, <u>A Comparison of Various Behind-the-Wheel Training Methods</u>, <u>Safety and Traffic Division</u>, <u>Automobile Club of Michigan</u>, 1962, p. 37.

¹⁸ Charles F. Hanner, "Use of Psychological Inventory in Writing Insurance for Youthful Male Drivers," Traffic Safety Research Review, National Safety Council, VII, 1 (March, 1963), pp. 5-9.



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

An understanding of behavior is essential for identifying a majority of the underlying causes of traffic collisions and violations.

Raters with an academic background and professional experiences in the behavioral sciences can predict a youthful driver's likelihood of accruing a traffic record of violations and/or collisions on the basis of behavior observed over a time period of at least 18 weeks.

Behavioral categories for predicting driver performance can be identified by response to items incorporated in the "Inventory."

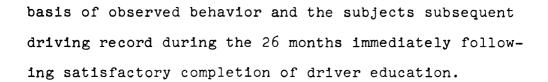
The Hypotheses

The hypotheses to be tested in this study are:

Ho₁.--There is a significant relationship between the rater's classification of subjects on the basis of observed behavior and the subject's response to items in the M. I.

Ho₂.--There is a significant positive relationship between response to items in the <u>Mann Inventory</u>, by behavioral categories, when the test is administered to two sample groups drawn from the same population.

Ho₃.--There is a significant positive relationship between the rater's classification of subjects on the



Definition of Terms

Conviction. -- Legal action arising out of the issuance and disposition of a citation for a moving violation other than one received at the time of a collision.

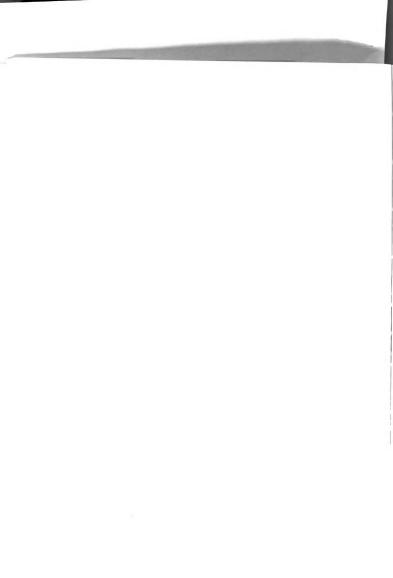
(A conviction arising out of a collision will be listed under the category--chargeable accident.)

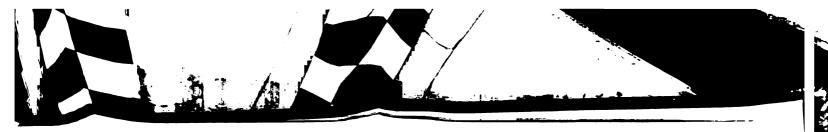
Chargeable Accident. -- An accident involvement for which the driver record file indicates the issuance of a citation and conviction of a moving violation arising out of the involvement.

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

Organization of the Study

The general plan of the study is to present in Chapter Two, the review of literature on the relationship of personality and personal/social adjustment to driving performance. The third Chapter is an account of the methodology used in collecting, organizing and tabulating the data, and the techniques employed in analyzing them. The results of the analysis are reported in Chapter Four. The summary, conclusions and implications for further study appear in Chapter Five.





CHAPTER II

REVIEW OF LITERATURE ON THE RELATIONSHIP

OF PERSONALITY AND PERSONAL SOCIAL

ADJUSTMENT TO ACCIDENT INVOLVEMENT

A review of literature reveals that man has attempted for many centuries to explain apparent unequal vulnerability to misfortune, (accidents). In fact, concern for this phenomenon is found in both religion and methology.

The search for an explanation of accident occurrence has progressed from the concept of "Act of God"
to simple data collection of observable physical factors
to the identification of unsafe behavior as a primary
factor in accident causation.

From the early 1920's^{2,3} until the late 1950's⁴ it was believed by many investigators that the accident

¹William Haddon, Edward Suchman and David Klein, Accident Research Methods and Approaches (New York: Harper and Row, 1964), p. 386.

²Major Greenwood and Hilda Woods, "The Incidence of Industrial Accidents with Special Reference to Multiple Accidents," Medical Research Committee, <u>Industrial Fatique Research Board</u>, Report No. 4, 1919.

³Major Greenwood and G. Yule, "An Inquiry Into the Nature of Frequency Distributions Representative of

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proneness concept could explain man's involvement in accident producing situations.

The work of Adelstein, however, demonstrates the weakness of the accident proneness concept when the factors of time and population at risk are controlled. His findings, with these controls, demonstrated that when time and exposures to risk were controlled, the accident rate for subsequent years actually increased when those men who had experienced the greatest number of accidents during the first year of a three-year study were removed from second and third year computations.

Miller, 6 demonstrates statistically that repeated accident involvement is an inadequate criteria for accident proneness. He illustrates mathematically that, among a group of 1,000 employees experiencing 1,500

Multiple Happenings with Particular Reference to the Occurrence of Multiple Attacks of Disease or of Repeated Accidents," Journal of the Royal Statistical Society, LXXXIII (1920), pp. 255-279.

⁴Tillman and Hobbs, op. cit., pp. 321-331.

⁵A. M. Adelstein, "Accident Proneness: A Criticism of the Concept Based Upon An Analysis of Shunters' Accidents," <u>Journal of the Royal Statistical Society</u>, Series A, CXV (1952), pp. 354-400.

Gene Miller, "Accident Repeaters May Not Be Accident-Prone," National Safety News, LXVII (March, 1953), pp. 3-6.

accidents within a given time period that 223 persons might be accident free. Conversely on the basis of chance, one person could be involved in as many as seven mishaps, and four others in six mishaps.

On the basis of the research reviewed it cannot be stated conclusively that accident proneness does not exist, however, it appears that proneness has received undue attention as an explanation of accident causation.

If one accepts accidents as a form of human behavior, a more promising conceptualization of the accident phenomenon appears to lie in the behavioral or adjustive approach involving both psychological and social factors.

. . . We begin by assuming that the accident did not simply happen by chance, but that it developed through the same stages as any form of human behavior and was characterized by the same kind of social and psychological forces as determine other types of social action. Once we view it in this fashion, we may analyze the accident situation for the kinds of decision-making processes involved, the motivational forces, the cultural influences, the role of social interaction, etc. In other words, we can now approach accidents as behavior and apply the same explanatory models that the behavioral sciences have developed for understanding human behavior in general.

If we discount the fact that much of the early work in the field of accident prevention was conducted to prove or disprove the accident proneness concept and concentrate instead on psychological characteristics and social adjustment, we find upon examination that the research

Herbert H. Jacobs and others, <u>Behavioral Approaches</u> to <u>Accident Research</u> (New York: Association for the Aid of Crippled Children, 1961), p. 43.



reveals a consistent pattern of digression from accepted norms of behavior among accident involvees. Further evidence tends to demonstrate identifiable personality variables. Dunbar describes accident repeaters as impulsive, impetuous people who concentrate on immediate pleasures and satisfactions. They are resentful of authority, essentially rebellious and cannot tolerate even self-discipline. Their attitudes toward sex and family are cavalier; they desire excitement and adventure, do not like to plan for the future, and are apt to act on the spur of the moment. They are sociable and happy-go-lucky, concerned over their own health and express guilt over the lack of achievement. Dunbar further states that:

. . . patients who are accident prone typically do not finish the educational courses which they under take, have an unstable work record, experience many changes in their jobs coupled with ups and downs of their income, are spontaneous and casual in their social relationships and have superficially good sexual adjustment, but are irresponsible toward their sexual partners and families.9

Similar findings by Alexander indicate that:

The correlation between a tendency toward impulsive action and a lack of tolerance for external or internal discipline on the one hand and accident proneness on the other appears to constitute

⁸F. Dunbar, Synopsis of Psychosomatic Diagnosis and Treatment as quoted by L. LeShan, "Dynamics in Accident-Prone Behavior," Psychiatry, 1952, p. 73.

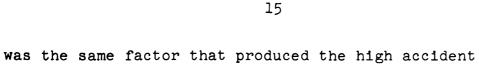
⁹F. Dunbar, "Medical Aspects of Accidents and Mistakes in the Industrial Army and in the Armed Forces," War Medical, IV, 1943, p. 167.

a definite casual relationship. It is easily understandable that an impulsive person, full of hostility and guilt feelings, will be inclined to have accidents. His actions are real and he has at the same time also a tendency towards self-punishment and suffering. He is incautious and at the same time is inclined to pay a price in the form of physical injury for his aggression. 10

Wong and Hobbs 11 in investigating personality characteristics among patients hospitalized as a result of accident involvement found the same characteristics in high accident groups in industry. Seven personality traits described as being characteristic of patients with multiple accidents were studied. They reported that the high and low accident individuals differed markedly as a group in their personality traits and social adjustments. The high accident worker was frequently from a broken home, showed evidence of conflict with authority in both childhood and adulthood, experienced contact with the juvenile court, had an irregular work history, and a history of being fired. Further characteristics were marital discord and contact with social agencies. The low accident worker rarely showed difficulty of this nature in his life history. The authors concluded that aggressiveness, which lead to difficulties in their personal lives,

¹⁰ F. Alexander, <u>Psychosomatic Medicine</u> as quoted by L. LeShan, "Dynamics in Accident-Prone Behavior," <u>Psychiatry</u>, 1952, p. 73.

¹¹W. A. Wong and G. E. Hobbs, "Personal Factors in Industrial Accidents," <u>Industrial Medicine and Surgery</u>, XVIII (July, 1949), pp. 291-294.

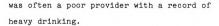


record at work.

Tillman and Hobbs 12 report similar findings for a group of 40 taxi-cab drivers representing the high and low accident groups in the company they worked for. A portion of their study consisted of obtaining the personal history of each driver, including his parental background, childhood and adolescent history and subsequent adult adjustment. Additional information was obtained from police files. This information was then compared with the individual's driving records. The group being tested though small produced highly significant results. The high and low accident groups differed markedly in their personality characteristics. The high accident group showed marked intolerance for and aggression against any authority dating from early childhood experiences in an unstable home background. In many instances this personality feature was evident in anti-social behavior. The high accident record itself was one manifestation of these personality characteristics. Among the high accident taxi drivers the following characteristics were evident:

> 1. A high incidence of parental divorce rate predominated. One or both parents were described as excessively strict. The father

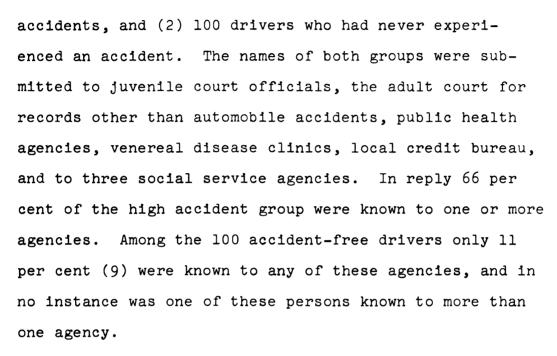
¹² Tillman and Hobbs, op. cit.



- 2. In the area of childhood adjustment 11 of the repeaters exhibited instability of an aggressive type, such as temper tantrums, frequent fights, bully characteristics, leader of a gang and frequent appearances at juvenile court. An equal number displayed complete opposite behavior manifested by regressive tendencies.
- Adjustment appeared to be average in terms of academic standing, but frequent truancy and disciplinary infractions were evidenced.
- 4. Social adjustment was lacking to a marked degree. They appeared to have many acquaintances but few friends. Emotional attachments were superficial and varied from day to day as their impulsiveness dictated. In a group they always attempted to be the center of attention.
- Behavioral patterns indicated immaturity, showing little concern over their problems, and personal distress tended to be accepted.

Since it was felt that taxi-cab drivers might not be representative of the general driving public, the names and addresses of two paired groups: (1) 96 male drivers who had suffered four or more automobile

•



In the high accident group, two persons were known to all sources. Three were known to four sources, nine to three sources, 60 to two sources, and 32 to one source. In the high accident group, the credit bureau had contacted 34.3 per cent, social agencies 17.7 per cent, public health venereal disease clinics 14.4 per cent, and the adult court 34.3 per cent exclusive of traffic charges, and the juvenile court 16.6 per cent.

In the low accident group, the credit bureau knew six individuals, the social agencies, adult court and juvenile court each had contact with one individual.

This report indicates that social maladjustment is common among both the general driving public and taxi-cab drivers who have experienced high accident frequency. 13

^{13&}lt;sub>Ibid</sub>.



The likelihood of an accident increases further with inexperience; with excessive speed; the partaking of alcoholic beverages; physiological or psychological fatigue; with certain specific psychological conflicts; and with the degree or intensity of such non-specific emotional factors as anxiety, hostility, frustration, and guilt. The chances for an accident are greatest if the young man is irresponsible and maladjusted; grew up in a maladjusted home; and was exposed in childhood to violence and strife, to over-authoritative parents or parent figures, to separation or loss of parents, and to accidents to himself, parents or siblings. The probability of an accident also grows with any increase in the duration or intensity of exposure to environmental hazards.

An accident is least likely to occur in a healthy well-adjusted young girl, age thirteen, born and reared in a normal, secure and loving home, in which both parents are well adjusted and if she has not experienced or witnessed major or frequent accidents in the past. The likelihood of an accident decreases further with the hours of night, the month of February, the mid-week, the home environment and a minimal exposure to hazards. Even with increased exposure and increased physical, physiological or psychological stress or strain, an accident is relatively unlikely to occur in this type of individual. 14

In a study comparing accident repeaters and accident-free junior high school students, Birnbach 15 employed The Bell Adjustment Inventory, National Safety Education Test, the New York State Physical Fitness Test for Boys, and The Rogers Strength and Physical Capacity Test. He reports that:

¹⁴ Morris S. Schulzinger, The Accident Syndrome; The Genesis of Accidental Injury (Springfield, Illinois: Charles C. Thomas Publishers, 1956), p. 213.

¹⁵ Birnbach, op. cit.

- 1. The repeater tends to be maladjusted in several areas, comes from a home where there is a high incidence of divorce and/or one in which at least one of the parents is overly strict.
- 2. As reported by teachers, the repeater is careless in preparing his school work and lacks industriousness. He seeks to avoid school as much as possible and capitalizes on his injuries and illnessess to stay away. Truancy is higher in this group than among accident free groups. Teachers generally rate these students poor in cooperativeness.
- 3. The repeater tends to be aggressive and attempts to dominate by physical means. In sports and games he is considered a poor sport due to his non-cooperative attitude.
- 4. Physical adventure and participation in dangerous and strenuous undertakings are regularly sought and enjoyed. Recklessness and eagerness to take chances and impulsive actions seems to best characterize the repeater. Due to his poor emotional adjustment and home and family relationships, it is difficult, he finds, to meet distress placed upon him by family and school.
- Among repeaters, nail bitting is prevalent. He is superstitious and given over to ritualism.

6. When frustrated, thwarted, or subjected to emotional strain, the repeater becomes rebellious. He is rebellious of authority and hates to be commanded. This resentment is often shown by bringing harm to himself and others. He shows no inhabitions, signs of remorse or fear of punishment, and attempts to regain prestige by physical powers, bullying, acts of bravado, and by flaunting authority.

The Eno study 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.



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



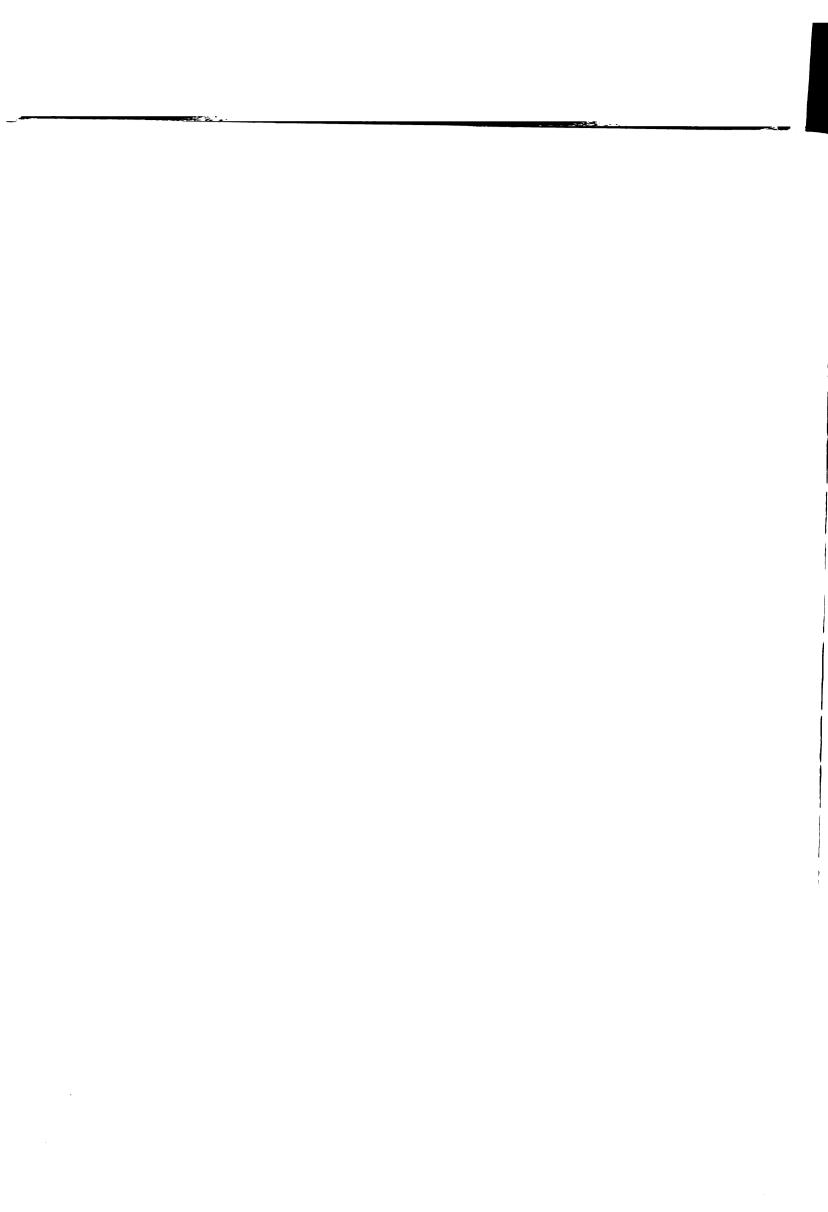
assurance: use this or that test in screening drivers for licensing purposes or in driver re-examination. But the development of such tests remains one of the prime needs and objectives. Experiments toward that end will be continued. 16

Schuster and Gilford 17 in a three-part study compared: (1) the better than average driver (a person who had a clear driving record for at least three years with no traffic citations or accident involvements), (2) chronic violators (persons who were currently under revocation for extremely poor driving records), and (3) accident repeaters (persons who had been involved in three or more accident involvements during the preceding three years). They found that when compared with selected, better than average drivers, the accident repeaters were significantly: more self-assertive, more active, more adventuresome, more sociable, more ambitious, younger, and less self-reliant. The observed differences probably reflect true differences in personality traits and attitudes of accident repeaters.

Compared with the selected better than average drivers, the chronic violators were significantly: less tolerant of others, less objective (hyper-sensitive), more adventuresome, less self-reliant, less friendly,

¹⁶ Brody, op. cit., pp. 1-2.

of Accident Repeater and Chronic Violator Drivers, A paper presented at the 47th National Safety Congress and Exposition, October, 1959, Chicago, Illinois.



and less stable emotionally. They were further characterized by fewer years of formal education and tended to drive more during hours of darkness.

West¹⁸ in 1946, diagnosed accidents of teenagers as lack of social responsibility. His observations include the incorporating in the curriculum, preparation for life, such as good citizenship and safety education necessary to function in a modern technological society. It appears then that a function of education in this sense must include effective psychiatric diagnosing and counseling for the accident repeaters.

Hanner 19,20 reports a highly successful experience when using a psychological inventory developed by himself and assistants to categorize male automobile insurees. Subsequent driving experience substantiated that it is possible to classify drivers on the basis of such an inventory. Additional cross validation using the Personal History Data indicates that personal history data likewise may be sued successfully, it does not, however, have as

¹⁸ Roscoe L. West, "The Philosophy of the Accident Problem," The Journal of Educational Sociology, October, 1946, pp. 74-77.

¹⁹ Hanner, "Use of the Psychological Inventory . . .," op. cit., pp. 5-9.

²⁰Charles F. Hanner, "Use of Personal Data In Underwriting Setting," Traffic Safety Research Review, VII, 1 (March, 1963).



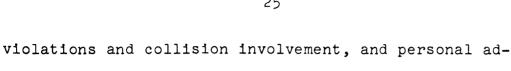
great a potential use as the inventory, except that when the two are used together they may give even greater insight into the potential driving behavior of insurees.

Perhaps the most ambitious research project undertaken to date to determine the relationship between personality, behavioral factors and social factors, is that reported by Lynnete Shaw in "The Practical Use of Projective Personality Tests as Accident Predictors," 21 employing the TAT and a counter-part developed by the Industrial Psychological Services and Operational Research Bureau, the SRT, Social Relations Test.

This project represents an effort to develop a screening device for prospective bus drivers for PUTCO (Public Utility Transportation Corporation, Johannesburg, South Africa). It was conducted by the Industrial Psychological Services and the Operational Research Bureau, Johannesburg, South Africa. The results of this ten year study demonstrate a very strong relationship between response to items in the Thematic Apperception Test-TAT-and Social Responsibility Test-SRT-and driving record when the tests are modified specifically for urban African natives. The study further dramatically illustrates the relationship between a good driving record, as measured by company records of convictions for traffic

²¹ Lynnete Shaw, "The Practical Use of Projective Personality Tests as Accident Predictors," Traffic Safety Research Review, IX, 2 (June, 1965), 34.

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justment and behavior.

One of the illustrations consists of a group of 281 subjects, 51 of whom had had repeated accident involvements over short periods of time. On the basis of the SRT and TAT test scores it was found that 96 per cent of these accident repeaters could have been accurately predicted.

From 1956 to 1960, 120 drivers were; involved in one accident and ten drivers in more than one accident due to driving in a reckless or dangerous manner; 51 of these drivers had, for one reason or another, been given the previously identified personality tests. Upon examination of test scores it was found that 80 per cent of this dangerous risk group had failed the TAT and SRT tests.

Miss Shaw categorizes accident risk into five broad classifications described, in part, as follows:

The Potentially Bad Accident Risk

The badly integrated or maladjusted person.

The person who is emotionally unstable and extremistic.

The person with a distorted apperception of life and a distorted sense of values.

The over-confident, self-assertive person.

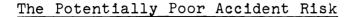
The person who harbors grudges, grievances and resentments.

The blame-avoidant person who is always ready with excuses.

The intolerant and impatient person.

The inadequate person with a driving need to prove himself.

The helpless and inadequate person who is constantly in need of guidance and support.



The person who displays little energy, stamina or interest.

The person who exhibits the personality faults of the bad accident risk, but in a less pronounced manner.

Also included in this group is the person whose faults or weaknesses are such that they could possibly improve in time, but the learning process is likely to be so expensive that he is really a poor risk--especially as a professional driver.

The Potentially Borderline Accident Risk

The weak person who could be easily influenced.

The person who is nervous and lacking in self-confidence.

The person who has unresolved conflicts, but who gives evidence of a constructive, but as yet unsuccessful, effort to make adequate adjustments to these conflicts.

The person with a not-too-pronounced anxiety neurosis. (This may make him ultracautious at the moment but he must be regarded as a doubtful risk, as he may deteriorate.)

The Potentially Fair Accident Risk

The person whose intentions are good, even if his capabilities are not always commensurate with his intentions.

The person who has certain weaknesses or unresolved conflicts which, although they will not unduly upset the balance of his personality, will nevertheless always impose a certain strain on him and slightly impair his efficiency.

Also included in this group is the person whose faults and weaknesses are such that they will probably improve in time but who at the moment cannot rise above them and who is currently therefore only a fair risk.

The Potentially Good Accident Risk

The balanced and mature and well-controlled person with a healthy and realistic outlook, satisfactory interpersonal relations, a kindly and tolerant attitude to others, a well developed social and civic conscience and an ingrained sense of responsibility.



The person who, as yet, cannot be said to be quite mature but whose motivations are sound and who demonstrates an ability to learn quickly by experience and profit by his mistakes. (This sort of person will undoubtedly have a learning period before his record stabilizes itself at a good level.)

The contented person who is in no way outstanding but who is friendly, cheerful, adaptable and accepting--provided he is reasonably intelligent, realistic and mature.

The rather withdrawn introvert--provided that he is not too maladjusted [underlining added]

It would, in any case, be virtually impossible to prepare a guide that would cover all contingencies, for, one must stress again, it is the total personality pattern that matters and particularly the balance and integration of that pattern. This whole study has emphasized that, if this is sound, and the person functions on a fairly even keel, is well adjusted to his circumstances and has learned to live with himself and his environment, then the prognosis is good. If there is a pronounced imbalance of any kind, if the person is poorly integrated, if his adjustments are adequate or unrealistic, then the prognosis is bad. . . .

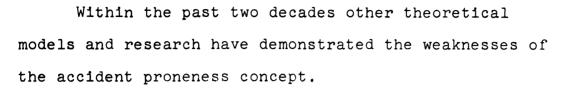
The writer feels that, although there is no doubt that the Good accident class does contain some strange personality patterns, the study reported here has lent confirmation to the fact that the Good group nevertheless contains a preponderance of individuals who are representative of the average good citizen, in that, although they may have their weaknesses, their limitations and their faults, they are nevertheless reasonably well balanced and well integrated people who have developed an ethical attitude toward life and a socially responsible code of behavior. 22

Summary

Early studies generally attempted to demonstrate accident proneness as the major factor in the occurrence of injurious mishaps.

^{22&}lt;u>Ibid</u>., pp. 64, 65, 69.





A more promising approach, involving both psychological and social factors, appears to lie in the behavioral or adjustive model of accident prevention.

CHAPTER IIT

DESIGN AND METHODOLOGY

The Test Instrument

The M. I. consists of 63 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 M. I. and the response sheet).

The M. I. in its original form consisted of 100 items selected on the basis of face validity by Dr. William Mann of the Highway Traffic Safety Center at Michigan State University, East Lansing, Michigan. 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

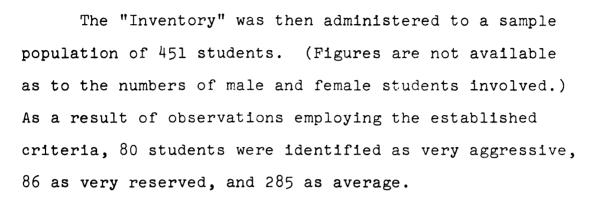
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gathering of this data were at the time enrolled in the course, "Personality Factors in Traffic Safety," taught by Dr. Mann and were pursuing advanced degrees in the field of Traffic and Safety Education.

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

- 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.
- 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.
- Average: All students who do not fall into either of the other classifications.

lJohn G. Schaff, "Personal Attitude Survey" (unpublished Master's dissertation, Michigan State University, 1957).

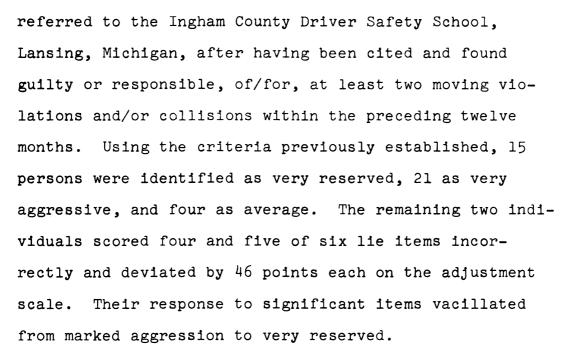


The response to each of the items were tabulated for each of the three identified categories, and significant differences were determined by chi square analysis. The results of this analysis disclosed that 18 items appeared to discriminate between the three categories: four at the .10 level, eight at the .05 level, one at the .02 level, four at the .01 level, and one at the .001 level of significance. Thirty-seven items were deleted from the "Inventory" since nearly all students gave identical responses.

An adjustment scale was established by determining the response(s) of 85 per cent of the Average population to each of the remaining 63 items. Analysis revealed that the response of 85 per cent of the Average population deviated from this response pattern by 7-19 points.

The remaining 63 items were edited on the basis of the pilot study. These items make up the instrument now identified as the M. I.

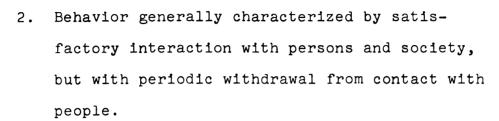
The M. I. was subsequently administered to three successive classes—a total of 42 persons—who had been



On the basis of the above research and other work undertaken by the author, it appears that the M. I. may be a helpful instrument for use in the identification of basic behavior patterns and for predicting driving behavior.

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.

1. Behavior characterized by well adjusted interaction with persons and consistent with the norms of the society in which the individual lives.

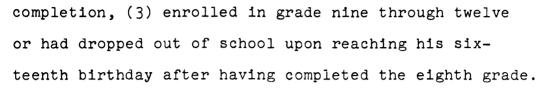


- 3. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic efforts toward assertive action.
- 4. Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others.
- 5. Behavior characterized by withdrawal from contact with other persons.
- 6. Behavior characterized by a pendulum effect, vacillating between extremes of aggression and withdrawal.

Sample Selection

The sample population of this study consists of 1057 subjects, 523 males and 534 females who were enrolled in driver education at Sexton High School, Lansing, Michigan between September, 1958 and June, 1960.

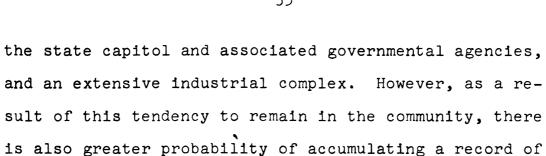
All of the sample population had: (1) enrolled in and <u>satisfactorily completed</u> driver education during the periods of September, 1958, to June, 1959, or September, 1959, to June, 1960, (2) attained a minimum age of 16 years or a maximum age of 18 years by time of course



With an enrollment of approximately 2,000 students, Sexton High School affords a comprehensive cross-section of the ethnic and socio-economic groups of both the city of Lansing and the surrounding rural areas.

Unlike many schools of similar size, the policy in driver education at Sexton is to assign students to a single instructor for all phases of the program. Instructional phases—classroom, multiple car method of instruction, and on-street experience—take place concurrently over an 18-week semester. This system provides the instructor greater opportunity to become more closely acquainted with students and to evaluate their behavior than is typically true in a program of comparable size. This type of scheduling also helps to overcome one of the potential weaknesses of the initial evaluation of the M. I. in that the evaluation of student behavior is limited to two raters, rather than to the possible variations in interpretation and classification of the 20 persons cooperating in the previously mentioned pilot study.

The sample population is atypical in that a large percentage of both dropouts and graduates, tend to remain in the Lansing area. This is due to the presence of Michigan State University, the Lansing Community College,



either convictions or collisions within the city.

If a relationship between observed behavior and a record of moving violations and/or collisions is to be identified, an effective enforcement and records system is essential. The driver record file of the Lansing Police Department; which were made available for this research project, have been acclaimed nationally for their effectiveness.

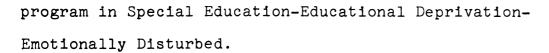
The Raters

Each of the raters had several years of teaching experience, including work at the junior high, senior high and college levels. During the investigation both raters were employed as full-time teachers of Driver Education at Sexton High School.

Both raters had earned Master of Science degrees in Traffic and Safety Education with emphasis in the behavioral sciences.

Both raters were pursuing doctoral degrees at
Michigan State University. One was enrolled in Traffic
Safety-Teacher Education with a cognate area in Counseling and Guidance, and the second was admitted to a





The raters had conducted Driver Improvement sessions for the Ingham County Driver Improvement program for at least one year prior to the investigation. Persons were directed to this program by the local Traffic Court Judges and the Driver Licensing Division, Secretary of State's Office after having accrued an unsatisfactory driving record.

As a result of professional preparation and experience both raters were sensitive to the kinds of behavior that are manifested by persons likely to become involved in traffic mishaps.

The Data

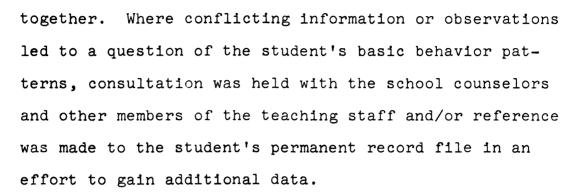
Two types of data were gathered on each student:

(1) response to items in the M. I. by behavioral category,
and (2) individual driving records.

Response to Items in the M. I. by Behavioral Category

The behavior of all students was observed throughout the semester by the raters. These observations took place while in the driver education classroom, during instruction on the off-street driving facility, while receiving on-street driving instruction, or anytime that circumstances brought the student and rater





The M. I. was administered to each student during the last week of a semester course in driver education.

Twenty minutes were allocated for completion of the "Inventory." Students were requested to answer all items as honestly as possible with assurance given that the results would not be used for grading purposes.

After weighing all available information, each individual response sheet was assigned to one of the six behavioral sub-groups; each sub-group was further classified as to male and female.

Individual Driver License Record

The individual driving records—convictions and/or collisions—were obtained from the driver record file of the Lansing Police Department. The decision to use the driver record file of the Lansing Police Department was made in light of three factors:

1. A high enforcement index, approximately 25-35, in any given year, and a police force and record file acclaimed for their effectiveness.

- 2. Since a majority of students enrolled in driver education at Sexton High School are between the ages of 15 years, 9 months, and 16 years, 6 months, at the time they complete driver education, it is assumed that a major portion of their driving experience during the first two years will take place within the city limits of Lansing, Michigan.
- 3. At the time of the study a paradox existed which since has been rectified. Persons between 16 and 17 years of age could be charged with moving traffic violations; however, such cases were heard in probate court. Upon conviction for a traffic offense final disposition was posted in the police department driver record files. Such a record of conviction would not be found in the driver record file of the Secretary of State's office, due to a Michigan statute which precluded posting such records to the file. Hence, a more accurate summary of an individual's driving record during the first two years could be obtained from the local police department.

Procedure of Analysis

Three procedures were utilized in the analysis of the data: (1) chi square test of significance, (2) the



cell square contingency method, and (3) product-moment coefficient of correlation.

Chi Square Test of Significance2

The chi square test of significance was employed to determine the difference between the responses of the six behavioral categories to the 63 items in the M. I.

The Cell Square Contingency 3

The cell square contingency was employed to determine which response or responses, by behavioral category, contributed most significantly to the total chi square value for each "Inventory" item.

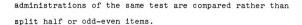
Product-moment Coefficient of Correlation4

The product-moment coefficient of correlation was employed to determine the reliability of the M. I. Application of the product-moment coefficient correlation is in effect the corrollary of the rational of the Spearman-Brown split half reliability coefficient. Two separate

²Sidney Siegel, <u>Non-Parametric Statistics</u> (New York: McGraw-Hill Book Company, Inc., 1956), pp. 174-179.

³J. P. Guilford, <u>Fundamental Statistics in Psychology</u> and <u>Education</u> (New York: McGraw-Hill Book Company, Inc., 1950), pp. 368-369.

Allen L. Edwards, Statistical Methods for the Behavioral Sciences (New York: Rinehart and Company, Inc., 1954), pp. 142-177.



Null Hypothesis

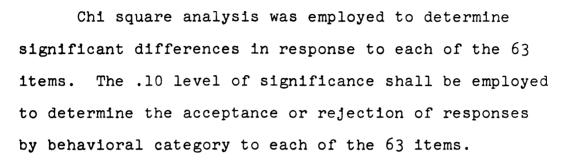
The following are restatements of the hypothesis in null form, i.e., the hypothesis that there is not a true difference between the six behavioral categories as they relate to the criterion.

- Ho1 There is no significant positive relationship between the rater's classification of subjects on the basis of observed behavior and the subject's response to items in the M. I.
- Ho₂ There is no significant positive relationship between response to items in the M. I. by behavioral category, when the test is administered to two sample groups drawn from the same population.
- Ho 3 There is no significant positive relationship between the rater's classification of subjects by behavioral category and subsequent driving record accrued during the 26 months immediately following satisfactory completion of driver education.

Summary

The sample population was drawn from Sexton High School, Lansing, Michigan. Response to items in the M. I. were collected upon completion of Driver Education during the school years of 1958-59 and 1959-60.

Driver license data for the sample was collected from the driver record file of the Lansing Police Department for a period of 26 months immediately following satisfactory completion of Driver Education.



The cell square contingency was employed to determine the most significant response or responses by behavioral category to each of the "Inventory" items. The .05 level of significance shall be employed to determine specific response or responses to items by behavioral category.

The product-moment coefficient of correlation was employed to determine the reliability of the instrument when comparing one administration of the test to a second administration. A correlation of .50 shall be required for the acceptance of reliability coefficient. (For 60 degrees of freedom, Guilford indicates that a correlation of .250 is significant at the .05 level.)⁵

⁵Guilford, op. cit., p. 610.





CHAPTER IV

STATISTICAL ANALYSIS

In this chapter are presented the analysis of:

(1) the relationship between the rater's classification of subjects on the basis of observed behavior and the subject's response to items in the M. I., (2) the reliability of response to items in the M. I. by behavioral category when comparing one test administration to another, (3) the relationship between the rater's classification of subjects by category and subsequent accrued driving record during the period of 26 months immediately following satisfactory completion of Driver Education.

Validity of the Instrument: Difference Between Response to Items in the M. I. by Behavioral Categories

The null hypothesis tested for each item in the M. I. was:

Ho There is no significant positive relationship between the rater's classification of subjects on the basis of observed behavior and the subject's response to items in the M. I.

When the response of the combined male and female populations are analyzed by behavioral category, chi



square values for 60 of the 63 items are found to be significant at or above the .10 level.

Response by behavioral category to items 2, 30, and 60 are not significantly different than zero at the .10 level; thus, the null hypothesis of no significant difference between response to items in the M. I. by behavioral category must be accepted for these three items.

For the remaining 60 items the null hypothesis must be rejected since response to items are significantly different than zero at the following levels:

- Response by behavioral category to items 10,
 21, 23, 26, and 31 are significantly different
 than zero at the .10 level.
- 2. Response by behavioral categories to items 46 and 58 are significantly different than zero at the .05 level.
- 3. Response by behavioral categories to items 19 and 63 are significantly different than zero at the .02 level.
- 4. Response by behavioral categories to items 7, 28, 34, and 38 are significantly different than zero at the .01 level.
- 5. Response by behavioral categories to the remaining 47 items is significantly different than zero at or beyond the .001 level.

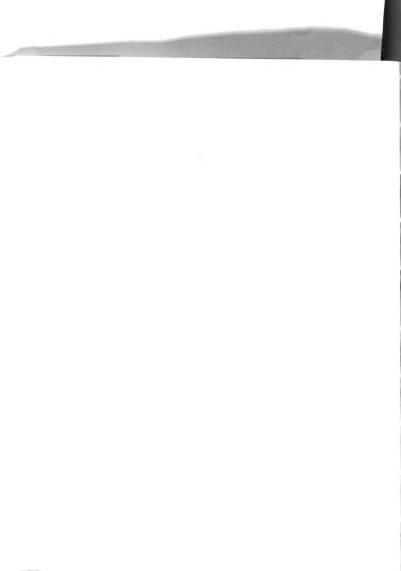
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Employing chi square analysis with the behavioral categories further divided according to sex identifies 37 items that are significant at or above the .10 level for the female population. Behavioral categories 4 and 6 do not appear in the analysis of data for the female population. In terms of course evaluation—pass or fail—both raters appear to have exhibited an identical bias in that females who were classified into either of the aforementioned categories failed in such disportionate numbers that an insufficient female population remained for applicable statistical treatment.

Response of the female population by behavioral category to 26 items, numbers: 2, 6, 10, 17, 18, 19, 20, 22, 23, 26, 27, 30, 31, 34, 35, 39, 40, 42, 50, 51, 53, 56, 58, 60, 62, and 63 are not significantly different than zero; thus, the null hypothesis of no significant difference between response to items in the M. I. by category must be accepted for these 26 items.

For the remaining 37 items the null hypothesis must be rejected since response to items are significantly different than zero at the following levels:

- Response by behavioral categories to items 4,
 7, 15, 25, 28, 37, 38, 46, and 49 are significantly different than zero at the .10 level.
- Response by behavioral categories to items 8,
 12, 16, 21, 41, and 59 are significantly
 different than zero at the .05 level.



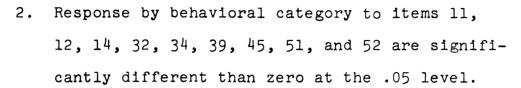
- 3. Response by behavioral categories of items 11, 14, and 57 are significantly different than zero at the .02 level.
- 4. Response by behavioral categories to items 3, 5, 13, 36, and 47 are significantly different than zero at the .01 level.
- 5. Response by behavioral categories to items 1, 9, 24, 29, 32, 33, 43, 44, 45, 48, 52, 54, 55, and 61 are significantly different than zero at the .001 level or above.

Analysis of the 63 items for the male population identifies 47 items significant at or above the .10 level.

Response of the male population by behavioral category to 16 items, numbers: 2, 15, 21, 23, 25, 26, 28, 29, 30, 31, 36, 38, 46, 55, 58, and 60 are not significantly different than zero at the .10 level; thus, the null hypothesis of no significant difference between response to items in the M. I. by behavioral category must be accepted for these 16 items.

For the remaining 47 items the null hypothesis must be rejected since response to items are significantly different than zero at the following levels:

1. Response by behavioral category to items 5, 10, 13, 19, 35, and 39 are significantly different than zero at the .10 level.



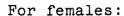
- 3. Response by behavioral category to items 20 and 24 are significantly different than zero at the .02 level.
- 4. Response by behavioral category to items 4, 6, 8, 9, 17, 22, 27, 37, 41, 53, 56, 61, and 62 are significantly different than zero at the .01 level.
- 5. Response be behavioral categories to items 1, 3, 16, 18, 33, 40, 42, 43, 44, 47, 48, 49, 50, 54, 47, and 59 are significantly different than zero at the .001 level or above.

Through the use of the cell square contingency matrix it is possible to identify a specific response or responses that contribute most significantly and positively to the total chi square value for each of the significant items.

Investigation reveals that 20 to 39 items are significantly related to the various behavioral categories. The number of related items by behavioral category and sex is shown below. 1

¹For specific items significantly related to each behavioral category, see Appendix B.

.



 Category 1
 = 28 items

 Category 2
 = 25 items

 Category 3
 = 36 items

 Category 4
 = 20 items

For males:

 Category 1
 = 25 items

 Category 2
 = 36 items

 Category 3
 = 31 items

 Category 4
 = 39 items

 Category 5
 = 39 items

 Category 6
 = 20 items

Reliability of the M. I.

Ho₂ There is no significant positive relationship between response to items in the M. I. by behavioral category, when the test is administered to different groups drawn from the same population.

At 63 degrees of freedom, with coefficients of correlation not less than .755 and .697 for females and males, respectively, reliability coefficients are significant above the .01 level; thus, the null hypothesis must be rejected since the correlation coefficients are significantly different than zero above the .05 level criterion value of .250.

Inter-Group Correlations for Females, Table 4.1, and Inter-Group Correlations for Males, Table 4.2, demonstrate the level of correlation derived by use of the product-moment correlation coefficient, when test administrations are compared for successive years.



TABLE 4.1.--Inter-group correlations for response to items in the M. I.-successive test administrations--females.

Category	Always	Usually	Sometimes	Rarely	Never
1	.986	.976	.968	.961	.985
2	.970	.901	.887	.893	.965
3	.916	.785	.771	.828	.861
5	.906	.755	.810	.768	.896

TABLE 4.2.--Inter-group correlations for response to items in the M. I.-successive test administrations--males.

Category	Always	Usually	Sometimes	Rarely	Never
1	.965	.925	.942	.944	.964
2	.951	.872	.850	.809	.907
3	•934	.859	.858	.898	.887
4	.860	.764	.805	.710	.849
5	.921	.754	.697	.808	.887
6	.952	.879	.848	.808	.901

Guilford states:

Taking correlations just at large, without particular regard to their use and as a general orientation, we may say that the strength of relationship can be described roughly as follows for various r's:

Less than .20 . . . Slight; almost negligible

relationship

.20 - .40 . . . Low correlation; definite

but small relationship .40 - .70 . . . Moderate correlation; substantial relationship



.70 - .90 . . . High correlation; marked relationship

.90 - 1.00 . . . Very high correlation; very dependable relation-ship²

Application of Guilford's constraints to the data in Tables 4.1 and 4.2 demonstrates a high or very high correlation in all categories.

Prediction of Driving Behavior

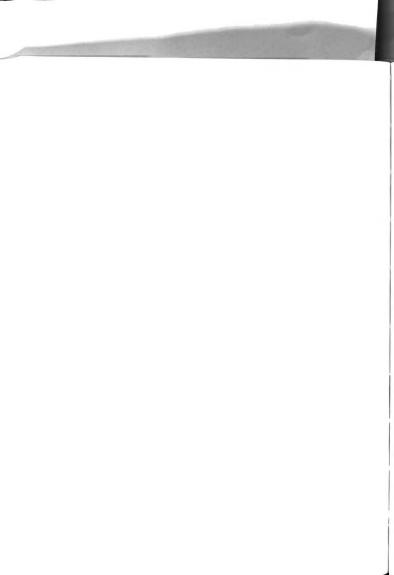
Ho₃ There is no significant positive relationship between the rater's classification of subjects by behavioral category and subsequent driving record accrued during the 26 months immediately following satisfactory completion of driver education.

If an individual's adjustment provides an index to his future behavior as a driver, a relationship should exist between his behavior and his driving record as measured by collision involvement and/or convictions for moving violations.

Investigation of Ho₃ is an attempt to ascertain whether or not the identification of persons by behavioral category would be of value in predicting an individual's driving record for some identified period of time.

In Table 4.3 is contained a summary of the driving record of the sample population according to behavioral category and sex for a period of 26 months immediately following satisfactory completion of Driver Education as

²Guilford, op. cit., p. 165.

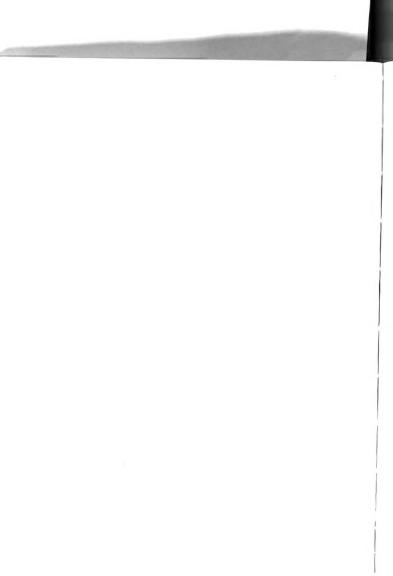


Behavioral Categories	Sex	А	В	Ü	Q	ы	Ľr.	Ö	Ж	н	ъ	×	'n	Σ	z	0	۵ı	
Category l	또	353 220	286	27-28 28-29	35 43	 	2-3 5-5	5-10 16-34	5-10 14-29	0 2-2	40-45	29-31 35-36	27 34	2-4 1-2	10-10 15-15	18-19 20-21	1-2	
Category 2	ĿΣ	97 84	80	6-6 8-10	11	8 15	3-4	0 5-11	3-7	2-2	11-11	9-10 11-13	80	1-2	2-2 5-6	6-6	1-2	•
Category 3	<u></u> μ Σ	42 86	31 49	2-2 6-7	4 21	3	1-2 9-11	5-11	4-9 7-18	1-2 3-3	9-15	4-6 18-22	2 14	2-4 4-8	1-1 9-10	3-5 8-10	0	
Category 4	ωΣ	45	2	3-5	13	н®	2-2	1-3	1-3 8-21	0 14-39.	4-6 35-73	3-3 22-36	3	08-22	3-3	10-01	0 5-16	
Category 5	ĿΣ	27 38	11	6-7 4-4	∞ rJ	2	6-9 5-8	2-4 16-38	0 6-14	2-2	10-12	14-18 18-27	11	3-7	5-6 6-6	8-9 7-8	1-3 5-13	
Category 6	ĿΣ	50	0	3-5	2	ч e	1-1 9-11	3-6 28-90	1-2 12-37	2-3 16-24	5-8	6-8 28-40	18	2-4 10-22	3-3 12-13	1-1 10-13	2-4 6-14	

r = female, M = male.

A = total number of persons in category; B = total number of persons with (0) convictions and (0) collisions; C = number of persons with a record of (1) conviction; E = number of persons with a record of (1) conviction and (1) or more collisions; F = number of persons with a record of (1) conviction and (1) or more collisions,—total collision number of convictions with a record of (2) or more convictions and (0) collisions—total number of convictions; H = number of persons with a record of (2) or more convictions and (1) or more collisions—total number of convictions.

I = number of persons with a record of (2) or more convictions; K = total number of persons involved in collisions—total collision involvement; L = number of persons with a record of (1) collision involvement; M = number of persons with a record of (1) collision involvement; C = number of persons with a record of chargeable collisions only—total collision involvement; O = number of persons with a record of non-chargeable collisions only—total collision involvement; P = number of persons with a record of both chargeable and non-chargeable collisions—total collision involvement; P = number of persons with a record of both chargeable collisions—total collisions—tota



identified by the Driver Record Files of the Lansing, Michigan, Police Department.

Empirical evidence appears to indicate a difference between the driving records, convictions and/or collisions, of those individuals identified with behavioral categories 1, 2, and 3,

Category 1. Behavior characterized by well adjusted interaction with persons and consistent with the norms of the society in which the individual lives. Category 2. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic withdrawal from contact with people. Category 3. Behavior generally characterized by

satisfactory interaction with persons and society, but with periodic efforts toward assertive action.

and those persons whose observed behavior placed them in behavioral categories 4, 5, and 6.

Category 4. Behavior characterized by forceful, outgoing action or vigorous efforts to assert one-self over others.

Category 5. Behavior characterized by withdrawal from contact with other persons.

Behavior characterized by a pendulum behavior characterized by a pendulum

<u>Category 6.</u> Behavior characterized by a pendulum effect, vacillating between extremes of aggression and withdrawal.

<u>Conviction-Collision Experience by Behavioral</u> <u>Categories, Combined Female and</u> <u>Male Populations</u>

In Table 4.4 are contained the observed and expected frequency of collision involvement and record of convictions for moving violations. Analysis of Table 4.4 indicates:

TABLE 4.4--Conviction-collision experience by behavioral categories, combined male and female populations.

Behavioral Categories	H	С	E	Ą	Н	I	Total
Cat. I	a 419 o 365.4	55 52.6	71 67.8	7 26.6	19 33.1	2 27.7	573
Cat. 2.	a 135 b 115.4	14 16.6	23 21.4	4 8.4	3 10.4	2 8.7	181
Car. <	80 81.6	8 11.8	15 15.1	10 5.9	11 7.4	4 6.2	128
Cat. 4	a 9 5 33.2	4 4.8	9 6.2	7 2.4	9 3.0	14 2.5	52
Cal. 5	a 24 b 41.4	10 5.9	3 7.7	11 3.0	6 3.7	11 3.1	65
Cat. 6	a 7 5 37	6 5•3	4 6.9	10 2.7	13 3.3	18 2.8	58
Total	674	97	125	49	61	51	1057
		Cel	l Cont:	ingenc	ies		
Cat. 1	7.97	.11	.15	14.44	6.01	23.84	
Cat. 2	3.33	.41	.12	2.31	5.27	5.16	
Cat. 3	.03	1.22	.00	2.85	1.75	.78	
Cat. 4	17.64	.13	1.26	8.82	12.00	52.90	
Cat. 5	7.31	2.85	2.87	21.33	1.43	20.13	
Cat. 6	24.32	.09	1.22	19.74	28.51	82.51	
Total	60.49	4.81	5.62	69.49	54.97	185.32	= 380.70

³⁰ df, chi square 380.70, sig. level p > .001

a = observed frequency; b = expected frequency; B = (0) convictions, (0) collisions; C = (0) convictions, (1) or more collisions; E = (1) conviction, (0) collisions; F = (1) conviction, (1) or more collisions—total collision involvement; H = (2) or more convictions, (0) collisions—total number of convictions; I = (2) or more convictions, (1) or more collisions—total collision involvement.

- Behavioral categories 2 and 3 accumulated a
 driving record of convictions and/or collisions
 (Column B) during the test period that is not
 significantly different than expected by
 chance.
- 2. The number of persons with a record of zero convictions, but one or more collisions (Column C), and the number of persons with a record of one conviction, but zero collisions (Column E), is not significantly different than expected by chance for any one of the six behavioral categories.
- 3. The number of persons in category 1 with a record free of convictions and/or collisions (Column B), is significantly greater than expected by chance at the 5 per cent level of significance. In contrast the number of persons with a clear driving record in categories 4, 5, and 6 is significantly less than expected by chance.
- 4. The number of persons in categories 4 and 6 with a record of one or more convictions, plus collision involvement (Column F), or two or more convictions without collision involvement (Column H), is significantly greater than expected by chance.

- 5. a. The number of persons in behavioral category 5 with a record of one conviction and one or more collisions (Column F), was significantly greater than expected by chance.
 - b. To a lesser degree, but still in significantly greater numbers than expected by chance, persons in category 5 accumulated a record of two or more convictions plus collisions (Column I).
 - c. The number of persons in category 5 with two or more convictions, but without collision involvement (Column H), is not significantly different than expected.

With chi square of 380.70 (p > .001) the null hypothesis of no significant difference in driving record as related to observed behavior as defined in this investigation must be rejected. The relatively low experience of multiple convictions or collision involvement precludes chi square analysis for female and male populations on an independent basis.

Frequency of Conviction for Moving Violations

In Table 4.5 are contained the observed and expected frequencies of convictions for moving violations for the combined female and male populations which are further

TABLE 4.5.--Frequency of conviction for moving violations by behavioral category, combined female and male populations.

				on a control of the Commission and the Commission of the Commissio	
Behavior Categori		В	C	DG	Total
Cat. 1	a b	419 365.4	55 52.6	99 155.0	573
Cat. 2	a b	135 115.4	14 16.6	32 49.0	181
Cat. 3	a b	80 81.6	8 11.8	40 34.6	128
Cat. 4	a b	9 33.2	4 4.8	39 14.1	52
Cat. 5	a b	24 41.4	10 5.9	31 17.6	65
Cat. 6	a b	7 37.0	6 5•3	45 15.7	58
Total		674	97	286	1057
		Cell Co	ntingencies	3	
Cat. 1		7.97	.11	20.23	28.30
Cat. 2		3.33	.41	5.90	9.64
Cat. 3		.03	1.22	.84	2.09
Cat. 4		17.64	.13	43.97	61.64
Cat. 5		7.31	2.85	10.20	20.36
Cat. 6		24.32	.09	54.68	79.09
Total		60.49	4.81	135.82	201.12

¹⁰ df, chi square 201.12, sig. level p > .001

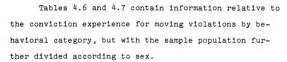
a = observed frequency; b = expected frequency; B = (0) convictions, (0) collisions; C = (0) convictions, (1) or more collisions; DG = (1) or more convictions for moving violations.

separated by behavioral categories. In this computation the influence of collision experience has been removed and computation is restricted to the analysis of convictions for moving violations.

The null hypothesis of no significant difference in the incidence of convictions for moving violations as related to observed behavior must be rejected. A chi square value of 201.12 exceeds the .001 level of confidence.

- The data observed in Columns B and C in Table
 4.5 are the same as the data observed in Columns
 B and C in Table 4.4.
- 2. Observation of Column DG demonstrates that behavioral categories 1, 4, and 6 contribute most
 highly to the total value of chi square in that
 the value of each of the cells would by itself
 exceed the .001 level of significance.
- 3. The cell value for behavioral category 5 in Column DG is significant at the .01 level.
- 4. The persons in behavioral category 1 demonstrate a record of convictions for moving violations significantly lower than expected by chance.
- 5. Those persons in behavioral categories 4, 5, and 6, have accumulated a record of convictions substantially higher than expected by chance alone.





Analysis of Table 4.6, Conviction Experience for Moving Violations by Behavioral Category--Female Subjects, reveals:

- Females in category 5 have accumulated a record of (0) convictions but (1) or more collisions (Column C) in greater numbers than expected by chance.
- Females in category 5 have accumulated a record of (1) or more convictions for moving violations (Column DG) in greater numbers than expected by chance.

In no other classification is a significant difference indicated for the female population. With chi square value of 28.46 (p > .001) the null hypothesis of no significant difference in conviction experience for moving violations by behavioral category must be rejected for the female population.

The findings presented in Table 4.7, Conviction Experience for Moving Violations by Behavioral Categories --Male Subjects, demonstrate a record essentially the same as that for the female population.

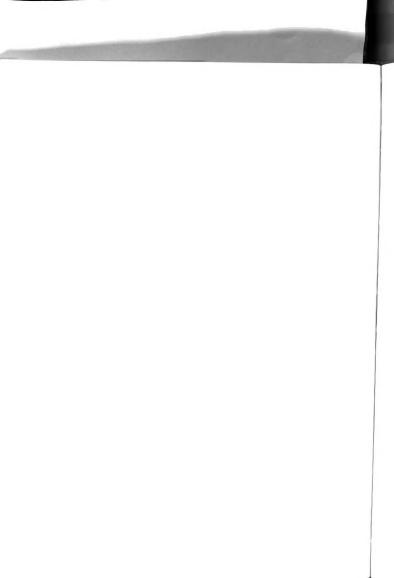


TABLE 4.6.—Conviction experience for moving violations by behavioral category—female subjects.

Behavior Categori		В	С	DG	Total
Cat. 1	a b	286 277.5	27 27.9	40 47.6	353
Cat. 2	a b	80 76.2	6 7.7	11 13.1	97
Cat. 3	a b	31 33.0	2 3•3	9 5.7	42
Cat. 5	a b	11 21.2	6 2.1	10 3.6	27
Total		408	41	70	519
		Cell	Contingenc	les	
Cat. 1		.26	.03	1.21	1.50
Cat. 2		.19	• 37	. 34	.90
Cat. 3		.12	.50	1.91	2.53
Cat. 5		4.91	1.24	11.38	23.53
Total		5.48	8.14	14.84	28.46

⁶ df, chi square 28.46, sig. level p > .001.

a = observed frequency; b = expected frequency; B = (0) convictions, (0) collisions; C = (0) convictions, (1) or more collisions; DG = (1) or more convictions for moving violations.

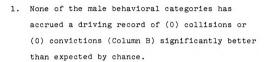


TABLE 4.7.--Conviction experience for moving violations by behavioral categories--male subjects.

Behavior Categori		В	C	DG	Total
Cat. 1	a b	133 11.0	28 21.9	59 87.1	220
Cat. 2	a b	55 42.0	8.3	21 33.2	84
Cat. 3	a b	49 43.4	6 8.6	31 34.0	86
Cat. 4	a b	7 22.7	3	35 17.8	45
Cat. 5	a b	13 19.1	4 3.8	21 15.0	38
Cat. 6	a b	7 25.2	3 5.0	40 19.8	50
Total		264	52	207	523
		Ce	ll Continger	ncies	
Cat. 1		4.36	1.70	9.07	15.13
Cat. 2		4.02	.01	4.48	8.51
Cat. 3		.72	.78	.26	1.76
Cat. 4		10.86	.50	16.62	27.98
Cat. 5		1.94	.01	2.40	4.35
Cat. 6		13.14	.80	20.61	24.55
Total		35.04	3.80	53.44	92.28

10 df, chi square 92.28, sig. level p > .001

a = observed frequency; b = expected frequency; B = (0) convictions, (0) collisions; C = (0) convictions, (1) or more collisions; DG = (1) or more convictions for moving violations.



- Those persons making up categories 4 and 6
 have fewer persons with driving records free
 of convictions or collisions than would be
 expected by chance.
- 3. In contrast to the female population, the conviction experience is not significantly different for those males identified with category 5 than those males identified with categories 2 and 3.
- Significantly fewer than expected of those males identified with category 1 had accured a record of convictions (Column DG).
- The males in both categories 4 and 6 had accumulated a record of convictions in significantly greater numbers than expected by chance.

The null hypothesis of no difference in "conviction experience for moving violations by behavioral categories, male subjects," must be rejected. Chi square of 92.28 (p > .001).

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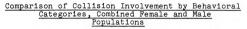


Table 4.8 contains a comparison of the total number of persons in each behavioral category with a record of (0) collisions to those persons with a record of (1) or more collisions.

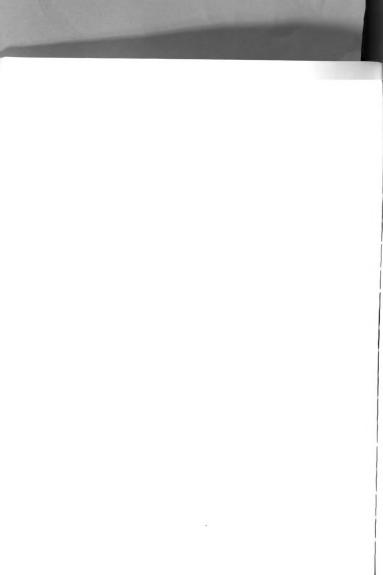
- a. The number of persons in behavioral category 1 with a record of (1) or more collisions is significantly less than expected by chance (Column K).
 - b. The number of persons in behavioral category 1 with a record free of any collision involvement is significantly greater than expected by chance.
- a. The number of persons in behavioral category
 who have no record of collisions is not significantly different than expected by chance.
 - b. The number of persons in behavioral category 2 who have experienced collisions is significantly less than expected by chance.
- The number of persons in behavioral category 3
 with or without a record of collisions or convictions is not significantly different than
 expected by chance.

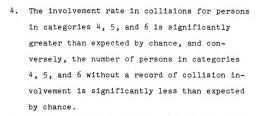
TABLE 4.8.--Collision involvement by behavioral categories --combined female and male populations.

Behavio Categor		BEH	K	Total
Cat. 1	a b	509 466.2	64	573
Cat. 2	a b	161 147.3	20 33.7	181
Cat. 3	a b	106 104.1	22 23.9	128
Cat. 4	a b	27 42.3	25 9.7	52
Cat. 5	a b	33 52.9	32 12.1	65
Cat. 6	a b	24 47.2	34 10.8	58
Total		860	197	1057
		Cell Con	tingencies	
Cat. 1		3.93	17.15	21.08
Cat. 2		1.27	5.57	6.84
Cat. 3		.03	.01	.04
Cat. 4		5.53	24.13	29.66
Cat. 5		7.49	32.73	40.22
Cat. 6		11.40	49.84	61.24
		29.65	129.43	159.08

⁵ df, chi square 159.08, sig. level p > .001

a = observed frequency; b = expected frequency; BEH = (0), (1) or (2+) convictions, (0) collisions; K = total number of persons involved in collisions.





The null hypothesis of no difference in record of collision involvement as related to behavioral category must be rejected. Chi square 159.08 (p > .001).

Table 4.9 contains the observed and expected collision involvement by behavioral category for the female population. The collision experience for the female population by behavioral category is comparable to the experience for convictions for moving violations.

- The collision experience for females in behavioral categories 1, 2, and 3 is not significantly different than expected by chance.
- The number of persons in category 5 who had been involved in collisions is significantly higher than expected by chance at the .001 level.

The null hypothesis of no significant difference in collision involvement by behavioral category for female subjects must be rejected. Chi square 50.031 (p > .001).

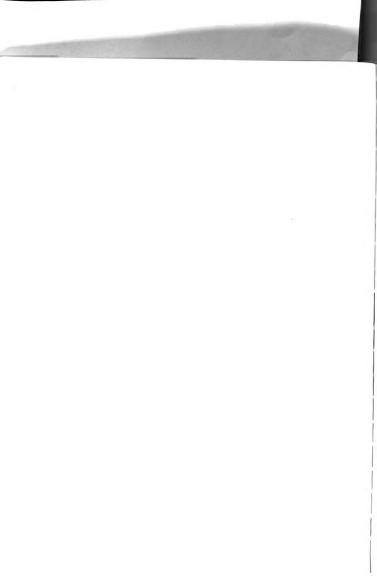


TABLE 4.9.—Collision involvement by behavioral categories—female subjects.

	-				
Behavioral Categories		ВЕН	K	Total	
Cat. 1	a b	324 315	29 38.1	353	
Cat. 2	a b	88 86.5	9 10.5	97	
Cat. 3	a b	38 37.5	4 4.5	42	
Cat. 5	a b	13 24.1	14 2.9	27	
Total		463	56 	519	
		Cell	Contingencies		
Cat. 1		.26	2.17	2.43	
Cat. 2		.02	.21	.23	
Cat. 3		.00	.06	.06	
Cat. 5	Cat. 5 5.11		42.48	47.59	
Total 5.3		5.39	44.92	50.31	

³ df, chi square 50.31, sig. level p > .001

a = observed frequency; b = expected frequency;
B = (0) convictions, (0) collisions; E = (1) conviction,
(0) collisions; H = (2) convictions, (0) collisions; K = total number of persons involved in collisions.



Table 4.10, Collision Involvement by Behavioral Categories--Male Subjects, indicates:

- 1. The collision involvement for the male population in categories 1 and 2 is significantly less than expected by chance (Column K).
- 2. The collision involvement of the male population in category 3 is not significantly different than expected by chance.
- 3. The male population in categories 4, 5, and 6 were involved in collisions with such frequency as to be significantly greater than expected by chance.

The null hypothesis of no significant difference in collision involvement by behavioral category for the male population must be rejected. Chi square 65.48 (p > .001).

Chargeable and Non-chargeable Collision Experience by Behavioral Category

In Table 4.11 are contained the observed and expected frequencies of collision involvement by behavioral categories. Specifically, comparisons are made of chargeable only, non-chargeable only, or combinations of chargeable and non-chargeable collisions experienced by behavioral category.

1. The collision involvement for persons in categories 2 and 3 is not significantly different than expected by chance.

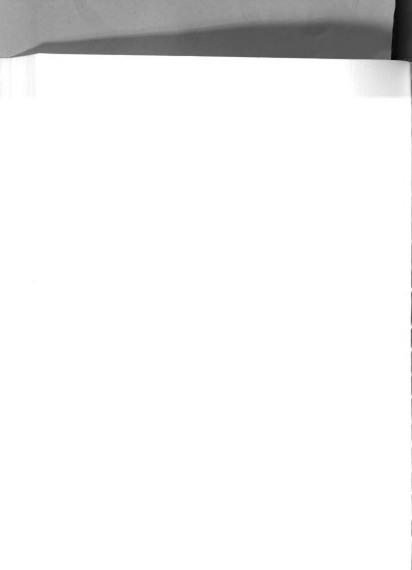


TABLE 4.10.--Collision involvement by behavioral categories --male subjects.

Behavioral Categories		BEH	К	Total
Cat. 1	a b	185 164.5	35 55•5	220
Cat. 2	a b	73 62.8	11 21.2	84
Cat. 3	a b	68 64.3	18 21.7	86
Cat. 4	a b	23 33.6	22 11.4	45
Cat. 5	a b	20 28.4	18 9.6	38
Cat. 6	a b	22 37.4	28 12.6	50
Total		391	132	523
		Cell	Contingencies	
Cat. 1		2.31	7.57	9.88
Cat. 2		1.66	4.91	6.57
Cat. 3		.21	.63	.84
Cat. 4		3.34	9.86	13.20
Cat. 5		2.48	7.35	9.83
Cat. 6	Cat. 6		18.82	25.16
Total		16.34	49.14	65.48

⁵ df, chi square 65.48, sig. level p > .001

a = observed frequency; b = expected frequency;
B = (0) convictions, (0) collisions; E = (1) conviction,
(0) collisions; H = (2) convictions, (0) collisions; K = total number of persons involved in collisions.

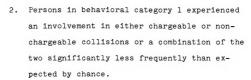
TABLE 4.11.--Chargeable and non-chargeable collision in-volvement by behavioral category--female and male populations combined.

Behavior Categori		ВЕН	N	0	Р	Total	
Cat. 1	a b	509 466.2	25 42.8	38 51.5	3 12.4	573	
Cat. 2	a b	161 147.3	8 13.5	10 16.3	2 3.9	181	
Cat. 3	a b	106 104.1	10 9.6	11 11.5	12.8	128	
Cat. 4	a b	27 42.3	10 3.9	10 4.7	5 1.1	52	
Cat. 5	a b	33 52.9	11 4.9	15 5.8	6 1.4	65	
Cat. 6	a b	24 47.2	15 4.3	11 5.2	8 1.3	58	
Total		860	79	95	23	1057	
Cell Contingencies							
Cat. 1		3.93	7.40	3.54	10.48	25.35	
Cat. 2		1.27	2.24	2.43	•92	6.86	
Cat. 3		.03	.01	.02	1.16	1.22	
Cat. 4		5.53	9.54	5.98	13.83	34.88	
Cat. 5		7.49	7.59	14.59	15.11	44.78	
Cat. 6		11.40	26.63	6.47	34.53	79.03	
Total		29.65	53.41	33.03	76.03	192.12	

¹⁵ df, chi square 192.12, sig. level p > .001+

a = observed frequency; b = expected frequency; BEH = (0), (1) or (2+) convictions, (0) collisions; N = chargeable collisions only; O = non-chargeable collisions only; P = both chargeable and non-chargeable collisions.





- 3. Those persons in behavioral category 4 were:
 - a. Involved in a significantly greater number of chargeable accidents than expected by chance.
 - b. Involved in a significantly greater number of both chargeable and non-chargeable accidents than expected by chance.
- 4. The number of persons in behavioral category 5 were:
 - Involved in non-chargeable collisions only in significantly greater numbers than expected by chance.
 - b. Involved in both chargeable and non-chargeable collisions in significantly greater numbers than expected by chance.
- 5. The number of persons in behavioral category 6 were:
 - a. Involved in chargeable only collisions in greater numbers than expected by chance.
 - b. Involved in both chargeable and non-chargeable collisions in numbers greater than expected by chance.



The null hypothesis of no significant difference in chargeable and non-chargeable collision involvement by behavioral category with female and male populations combined must be rejected. Chi square 192.12 (p > .001).

Due to the relatively low number of individuals in the total population involved in collisions during the period of time encompassed in the research, it is impossible to analyze the incidence of chargeable, non-chargeable, and chargeable plus non-chargeable collisions by sex and behavioral category. It is possible, however, to determine the degree of relative frequency through observation of Tables 4.12 and 4.13.

Summary

Statistical analysis of the data reveals:

When students are grouped on the basis of observed behavior, response to items in the Mann Inventory are significantly different for each behavioral category. Sixty of the 63 items are significant above the 10 per cent level of confidence for the sample population.

The response to items with the sample population divided by sex reveals 37 items that differentiate significantly for females and 47 items for males at or above the 10 per cent level of confidence. Response to 20 to 39 specific items are identified with any one of the six behavioral categories.



TABLE 4.12.--Chargeable and non-chargeable collision in-volvement by behavioral category--female population.

Behavio: Categor:		ВЕН	N	0	P	Total
Cat. 1	a b	324 315.0	10 12.2	18 23.8	1 2.1	353
Cat. 2	a b	88 86.5	2 3.4	6 6.5	1 •5	97
Cat. 3	a b	38 37.5	1 1.5	3 2.8	0.2	42
Cat. 5	a b	13 24.1	5 •9	8 1.8	1.2	27
Total		463	18	35	3	519

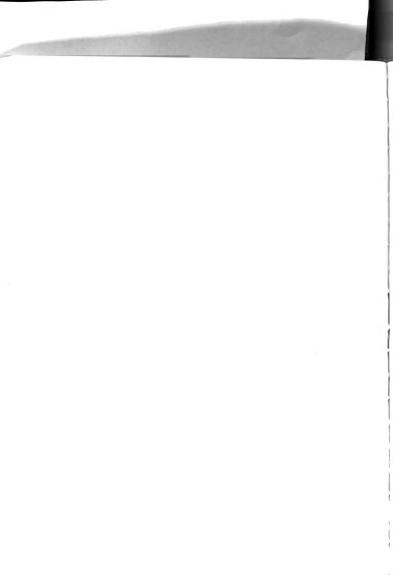
a = observed frequency; b = expected frequency; BEH = (0), (1) or (2+) convictions, (0) collisions; N = chargeable collisions only; O = non-chargeable collisions only; P = both chargeable and non-chargeable collisions.



TABLE 4.13.--Chargeable and non-chargeable collision involvement by behavioral category--male population.

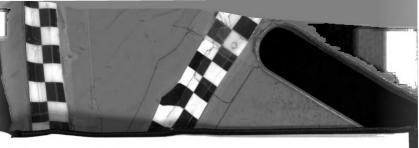
Behavior Categori		ВЕН	N	0	Р	Total
Cat. 1	a	185	15	20	0	220
	b	164.5	23.2	24.1	7.6	219.4
Cat. 2	a	73	6	4	1	84
	b	62.8	8 . 9	9 . 2	2.9	83.8
Cat. 3	a	68	9	8	1	86
	b	64.3	9.1	9.4	3.0	85.8
Cat. 4	a	23	7	10	5	45
	b	33.6	4.7	4.9	1.6	44.8
Cat. 5	a	20	6	7	5	38
	b	28.4	4.0	4.2	1.31	37.9
Cat. 6	a	22	12	10	6	50
	b	37.4	5.3	5.5	1.7	49.9
Total		391	55	59	18	523

a = observed frequency; b = expected frequency; BEH = (0), (1) or (2+) convictions, (0) collisions; N = chargeable collisions only; O = non-chargeable collisions only; P = both chargeable and non-chargeable collisions.



- 2. The reliability of the M. I. was determined by application of product moment coefficient of correlation to two separate administrations of the instrument. Correlation values of .697 .986 were derived. With 63 degress of freedom, these values indicate a high to very high correlation with marked or dependable relationships.
- 3. The relationship between the behavioral category 1 toward category 6 his driving record of convictions and/collisions increased.





CHAPTER V

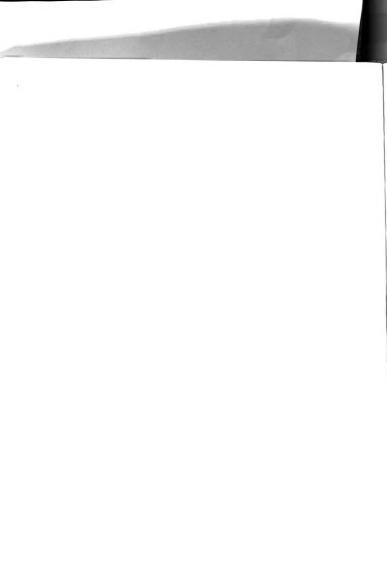
SUMMARY AND RECOMMENDATIONS

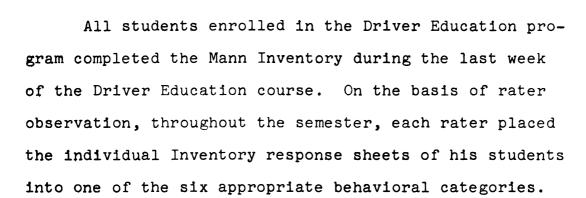
The primary purpose of this study was to investigate the validity and reliability of the Mann Inventory. An effort was made to ascertain whether or not persons classified into behavioral categories on the basis of observed behavior would respond differently to items in the M. I.

The secondary purpose of the study was to ascertain whether or not the observed behavior which identified an individual within a behavioral category would be reflected in subsequent driving record.

Sexton High School, Lansing, Michigan, was selected for this investigation on the basis of:

- A student body representing a broad crosssection of the population.
- A Driver Education program reaching several hundred students each year.
- Availability of comprehensive and professional police traffic record files.





The hypotheses were tested by means of chi square, the cell square contingency method and product-moment correlation.

Conclusions

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

Conclusion on the Relationship of Observed Behavior and Response to Items in the Inventory

- 1. A significant relationship exists between observed behavior and an individual's response to items in the Inventory. Findings of significant differences from .10 to .001 occurred with 60 of the 63 items.
- 2. There appears to be a difference in response to items in the Inventory on the basis of sex.

 Thirty-seven items differentiated for females and 47 items for males.



- The reliability of the instrument for all behavioral categories was extremely high. Correlation values of .697 to .986 were obtained when separate test administrations were compared.
- 4. Observed behavior in Driver Education can be a predictor of future driver behavior. As individual behavior deviated from category l toward category 6 the individual's record of convictions and/or collisions increased.

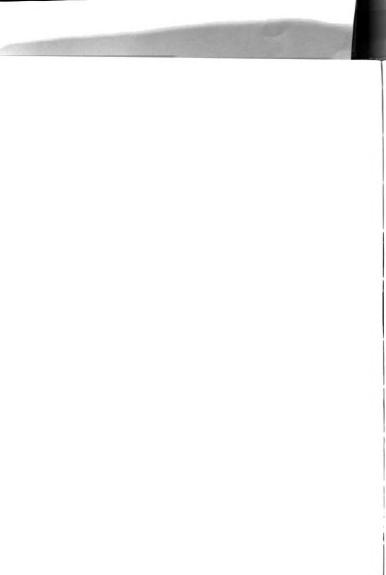
Behavioral Category 1. Behavior characterized by well adjusted interaction with persons and consistent with the norms of the society in which the individual lives.

Behavioral Category 6. Behavior characterized by a pendulum effect, vacillating between extremes of aggression and withdrawal.

Conclusions on the Relationship of Behavioral Categories and Driving Record

A highly significant relationship exists between observed behavior in Driver Education and driving record as attested to by the absence or presence of convictions for traffic offenses and/or collisions.

- Persons in Behavioral Category 1 were involved in significantly fewer collisions than expected by chance.
- Persons in Behavioral Category 1 were involved in significantly fewer times than expected by chance for moving violations.



3. The observed frequency of involvement in either collisions or convictions for be-havioral categories 2 and 3 did not deviate from the theoretical frequency.

Behavioral Category 2. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic withdrawal from contact with people.

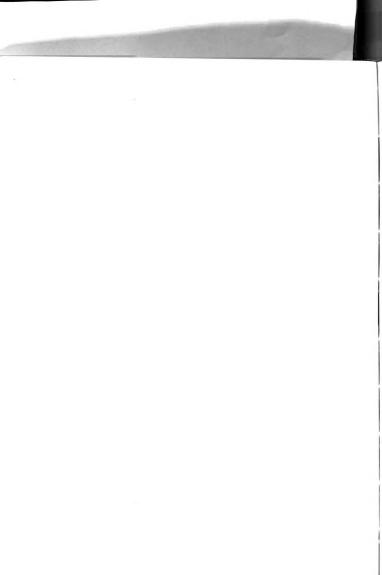
Behavioral Category 3. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic efforts toward assertive action.

4. The conviction and collision involvement of persons in Behavioral Categories 4, 5, and 6, is significantly greater than expected by chance.

Behavioral Category 4. Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others.

Behavioral Category 5. Behavior characterized by withdrawal from contact with other persons.

- 5. Persons in Behavioral Category 4 were involved in a disproportionately high number of charge-able collisions.
- 6. Persons in Behavioral Category 5 were involved in a disproportionately high number of non-chargeable collisions.
- 7. The persons in Behavioral Catetory 6 were involved in a disportionately high number of chargeable or both chargeable and non-chargeable collisions.



Discussion

Since the findings of this research have implications for pencil-paper tests, observer-rating behavior and driver behavior further discussion is warranted.

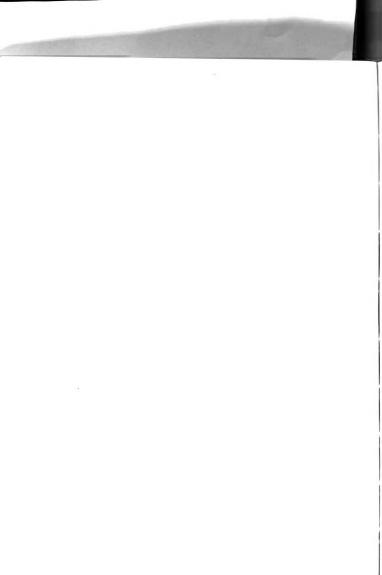
Mann Inventory and Raters

On the basis of the research it appears that individuals will express their feelings and response to items in a pencil-paper test in such a manner as to reflect their observed behavior.

Raters with comparable professional experience, classifying individuals independently, on the basis of established criterion can arrive at essentially the same categorization. For persons doing similar research, certain possible biases should be recognized. This problem was illustrated in the present research when both raters exhibited an identical bias toward females in Behavioral Categories 4 and 6. Females exhibiting certain characteristics, (aggressive behavior), were failed disproportionately, excluding them from the sample population. Had a female rater been included in the study, this bias might have been less apparent.

Observed Behavior and Implications for Driver Education Programs

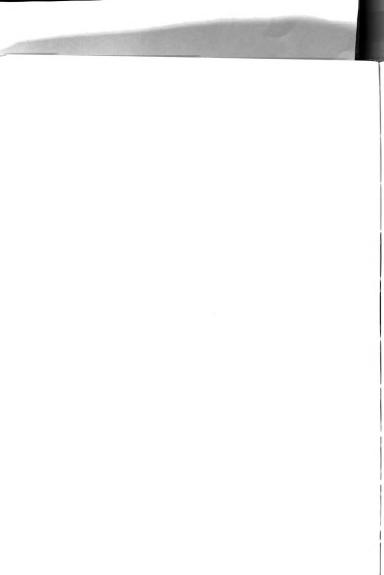
When the driving records of Behavioral Categories 1, 2, and 3 are compared to categories 4, 5, and 6, we



observe that 83.5 per cent of the sample population, 882 persons, experienced 273 convictions and 142 collisions during the test period, while 16.5 per cent of the sample population, 175 persons, experienced 253 convictions and 143 collisions. A question might well be raised as to the effectiveness of Driver Education as we know it today, among the three behavioral categories 4, 5, and 6, exhibiting deviant behavior.

Since we have no valid criteria against which to measure the experience of either the 882 relatively well adjusted students, or the 175 students who fell into the extreme behavioral categories, we can only surmise that Driver Education as it was taught at Sexton High School during the period of September, 1958 through August, 1960 was apparently successful among the relatively well adjusted student body. In fact, behavioral categories 2 and 3 might be considered a norm group for rarely were they involved in traffic offenses or collisions at a rate different than expected by chance. If this is true, however, then the program failed to meet the needs of students falling into behavioral categories 4, 5, and 6.

The extremely high number of female students in behavioral categories 4 and 6 who received failing grades in the course tends to indicate that the raters recognized the inadequacies of the program in preparing these students.





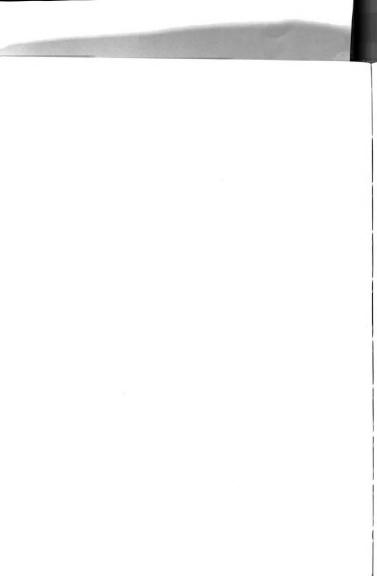
If we accept the previously stated conclusion, it would appear that an additional program should be provided for both female and male students in categories 4, 5, and 6.

One approach might well be the one presently employed in the typical Driver Education program if students are screened so that those students with identifiable problems of adjustment are channeled into a second type of program.

The second type of program might well be patterned along the lines of small group therapy sessions. One such approach is that suggested by Myrick, and Mann, respectively in, A Manual For Instructors Conducting Discussions on Driver Attitudes, and Let's Talk It Over. An approach similar to that suggested by these authors was employed for a period of three years in the Ingham County Driver Safety School in Lansing, Michigan. This program was conducted for persons (primarily males), convicted of two or more moving violations within a period of 12 months, and/or those persons whose license had previously been suspended or revoked, and who were again called in for a hearing. This program was structured in

¹Richard Myrick, Lawrence Schlesinger and Barbara Marx, A Manual for Instructors Conducting Discussions on Driver Attitudes, The George Washington University, November, 1962.

²William Mann, "Let's Talk It Over," <u>Analogy</u>, Charter Issue, 1966, pp. 4-9.



such a manner that class size was limited to 12 students, emphasis was placed upon group interaction in an attempt to gain greater understanding of one's own basic behavior. A follow-up study, conducted at the end of the third year, indicated that persons classified in behavioral categories 4 and 5 appeared to show substantial improvement in their driving record as compared to their record prior to entering the school. Persons classified as behavioral category 6 appeared to improve to a lesser degree.

In conclusion, if persons with a greater potential for involvement in collisions or for conviction of moving violations can in fact be identified, in advance, then it would appear that persons in the field of traffic accident prevention must reassess not only the goals, content, and type of driver education, but also driver licensing, driver improvement and other of the allied fields.

Recommendations

- A further follow-up on the 1057 drivers included in this study to ascertain whether or not the relationship between observed behavior and driving behavior continued beyond the test period.
- Determine whether persons who have been called in for driver license hearings because of unsatisfactory driving records are identifiable



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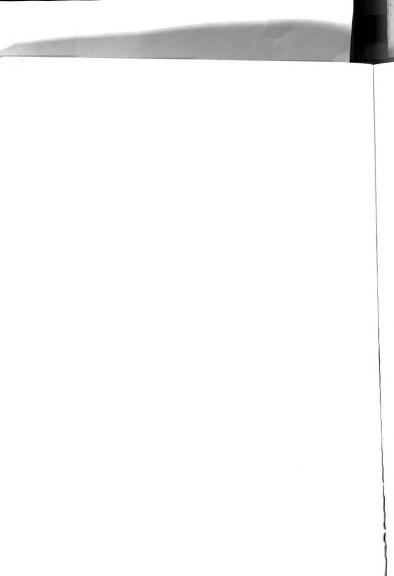
with any of the six behavioral categories employed in this study.

- Determine whether individuals identified as accident repeaters respond to items in the Mann Inventory in such a manner as to allow their classification according to the behavioral categories employed in this study.
- Determine the value of the Mann Inventory in areas outside the field of driver behavior.
- 5. Replicate the present study, but attempt to work with those persons identified as exhibiting behavior comparable to behavioral categories 4, 5, and 6, to determine whether or not, with special attention, the driving behavior of these groups might be improved.





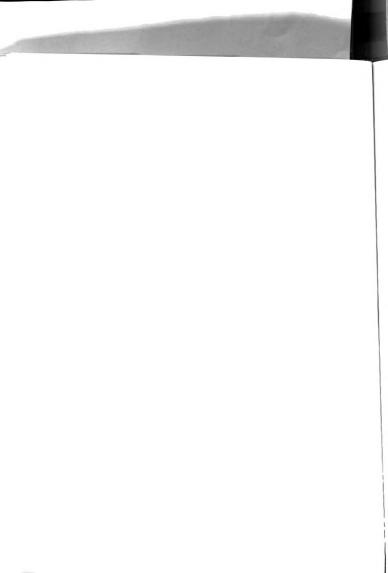
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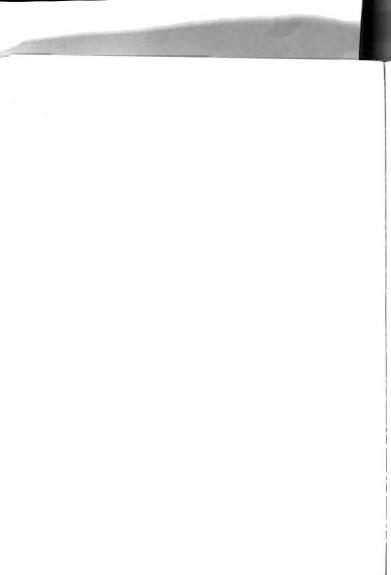
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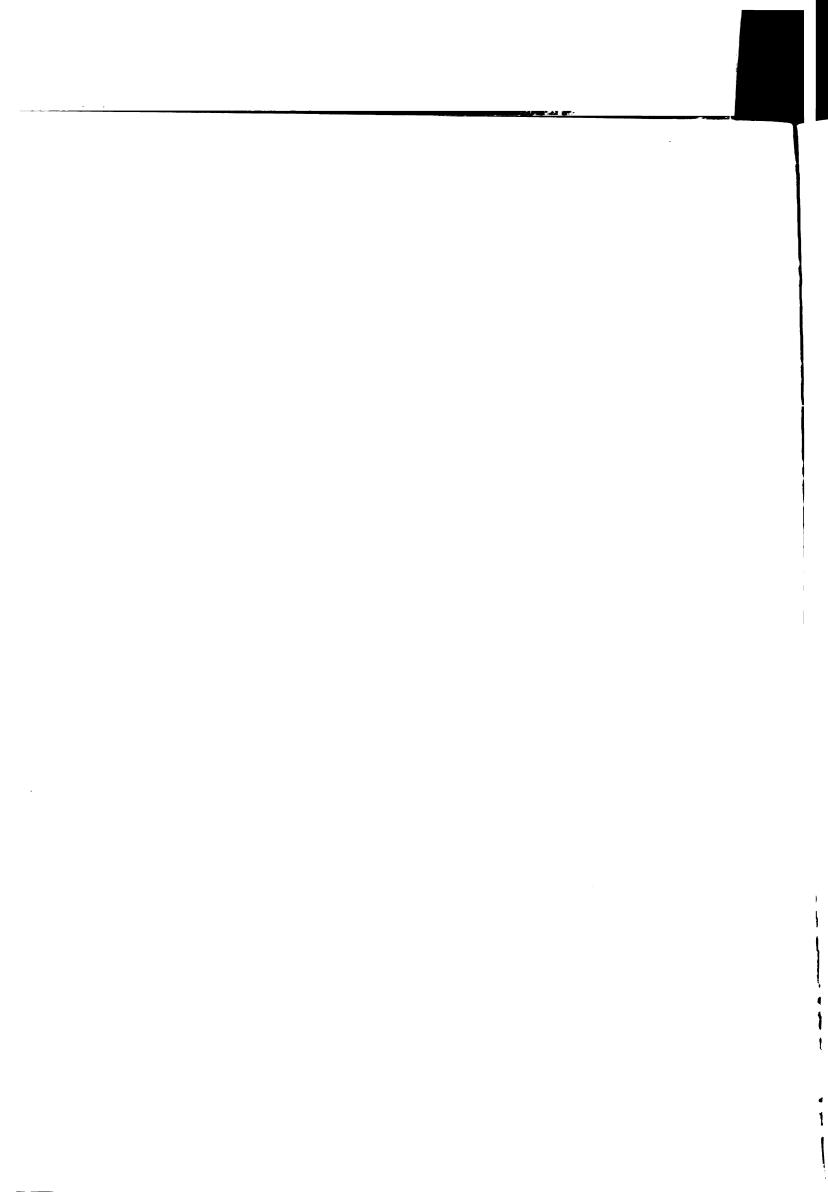
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APPENDICES

APPENDIX A

THE MANN INVENTORY AND RESPONSE SHEET





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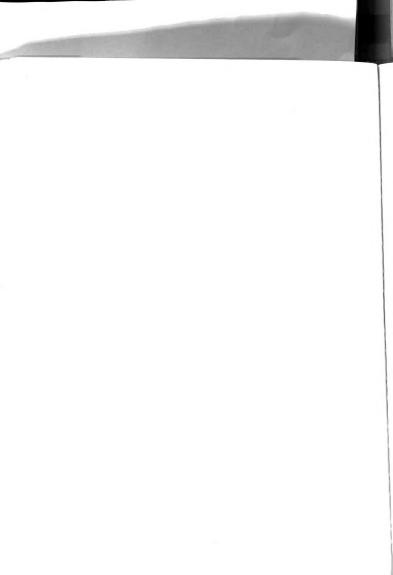
THE MANN INVENTORY

Name	Age	Sex	Months 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
- I (like) (liked) to take part in organized extracurricular 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) (were) reasonable in their relations with me. $\ensuremath{\text{\text{}}}$
- 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.
- 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.
- 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.
- All 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 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.



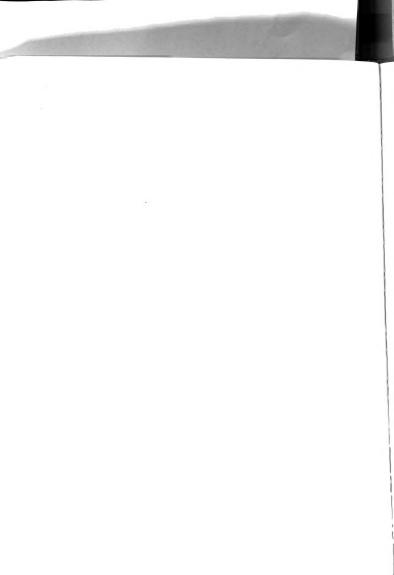
- 40. I have been wrong in an argument but wouldn't admit it to my opponent.
- 41. Society should have the right to question the way I drive.
- 42. I like to razz a team when it is losing.
- 43. I am proud of my reputation in the community.
- 44. I am considered a friendly person.
- 45. I like most of my work.

out.

- 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 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.

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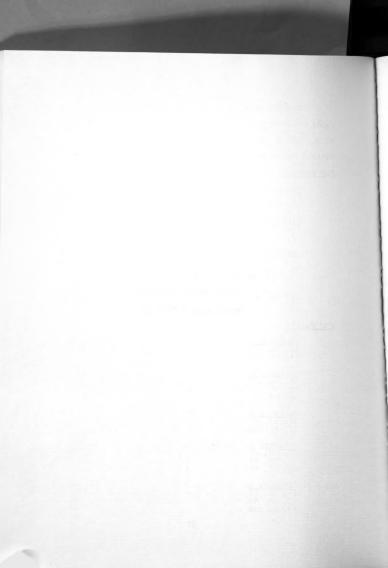
- 60. My folks (insist) (insisted) that I spend most week-day evenings at home.
- 61. I am considered a reliable person.
- 62. I like to help a person who is in trouble.
- 63. I am more courteous than the average driver.





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THE MANN INVENTORY

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3.	()	()	()	()	()	24.	()	()	()	()	()	45.	()	()	()	()	()
4.	()	()	()	()	()	25.	()	()	()	()	()	46.	()	()	()	()	()
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15.	()	()	()	()	()	36.	()	()	()	()	()	57.	()	()	()	()	()
16.	()	()	()	()	()	37.	()	()	()	()	()	58.	()	()	()	()	()
17.	()	()	()	()	()	38.	()	()	()	()	()	59.	()	()	`()	()	()
18.	()	()	()	()	()	39.	()	()	()	()	()	60.	()	()	()	()	()
19.	()	()	()	()	()	40.	()	()	()	()	()	61.	()	()	()	()	()
20.	()	()	()	()	()	41.	()	()	()	()	()	62.	()	()	()	()	()
21.	()	()	()	()	()	42.	()	()	()	()	()	63.	()	()	()	()	()





APPENDIX B

INVENTORY ITEMS FOUND TO BE SIGNIFICANTLY RELATED TO BEHAVIORAL CATEGORIES



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Category 6. Items 1, 6, 12, 14, 16, 20, 22, 27, 32, 35, 42, 43, 44, 45, 47, 51, 54, 56, 57 and 62.





