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Address to the Academy: Characteristics of the Driving Population with Respect to Age, Sex, Driving Habits and Accident Involvement

A. R. Lauer
Iowa State College

Characteristics of the Driving Population with Respect to Age, Sex, Driving Habits and Accident Involvement*

By A. R. Lauer

Introduction

Since the year 1500 science has progressed at an accelerated pace. Almost every known type of problem has been experimentally attacked and methods have been developed for unravelling the riddle of particular phenomenon in question. The scope of scientific research extends from the investigation of the innermost secrets of the nucleus of the atom to the classification of facts known about ultrastellar space. This relentless discipline has probed into the secrets of living organisms and the gamut extends from explorations of submicroscopic, the nonfilterable virus, to the courtship and living habits of the stone-age man of New Guinea. However, homo sapiens has only recently come round to exposing himself to the searchlight of scientific investigation.

This delay is exemplified by the fact that biology and the life sciences are much newer than the sciences of nonliving matter. We shall not use the term *natural sciences* since one science is as natural as another. Only during the last hundred and fifty years have the biological sciences rested on a firm theoretical and experimental basis. Until the cell theory was enunciated by Schleiden (3) and Schwann (4), biology had no sound scientific basis.

The physical sciences under the impetus of Galileo's contributions had about 300 years lead on the biological sciences. Psychology has had less than 100 years to establish itself as an experimental science, usually considered to start with Wundt in 1879. Genetics is only slightly older, or younger, depending upon whether we count from Mendel or De Vries.

Again we might consider the wide range or phases of interest in human behavior. Titles from the hearing mechanisms of the porpoise to the intelligence of the cockroach have been subjects for doctoral dissertations. Binet, principal originator of many

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present day intelligence tests, himself studied a myriad of behavior areas. His doctoral thesis was on some phase of the digestive system of microorganisms while he indulged in explorations in psychical research, mediums and other occult phenomena during his later years. Upon his death E. L. Thorndike once remarked, "Thank heaven we will now have a thousand fewer pages of French to translate each year."

A Neglected Phenomenon

One phenomenon has largely escaped scientific notice. This is the American automobile driver. It is to this particular variety of homo sapiens that we wish to direct your attention.

Numbering around 60,000,000 individuals throughout the United States the parameters needed for an adequate description of this phenomenon are almost innumerable. Only a few can be recounted in the brief time allowed in this paper.

Unlike most mammals the sexes are unequally divided. There are from two to three times as many males as females. No unusual polyandrous tendencies have been noted notwithstanding this unbalance of the sexes. Not only is the female in the minority but, since the male possesses most of the means of locomotion, she travels only about 10 per cent as far each year, at a substantially lower rate of speed and is rarely caught exceeding the speed limit. She shows most activity from 10:00-11:00 a.m., from 2:00-3:00 p.m. and during the early evening hours. She is rarely observed on the highways after midnight. Although often slandered by the male as being indecisive, her record for safe mobility is enviable.

Characteristics of the Male Driver

At present the average male driver is slightly over 36 years of age, he owns or drives a first series numbered model 1947* car, which has approximately 39,000 miles on the speedometer. The average male has had 18.3 years driving experience and travels slightly over 13,400 miles a year in his automobile. About 3,800 miles are driven in darkness and approximately 660 miles between midnight and 6 a.m. annually. It is known that he drives his car 9,300 miles during the year in daylight.

This individual is just short of having completed a high school education. Ultimately about six out of ten are caught and booked for violating traffic regulations. (There is no way of determining the number that are not caught.) One in ten has a serious re-

*The results are based on 1947, 1948 and 1949 data.

portable accident annually in his various migrations. One in eight has either a major reportable accident or a violation of traffic law and ordinance recorded against him annually. He learns slowly and after getting a license to drive tends to become progressively worse in his mobile habits for about six years as compared with the opposite sex.

The Female of the Species

The female of the species is somewhat younger, being only about 32 years of age. She drives a car about one year newer, a 1948 model having around 31,000 miles on the speedometer. Her driving experience averages 13 years. Considerably less mobile at the wheel she travels only about 3,500 miles a year, 2,800 of which are in daylight, 700 after dark and less than 100 miles between midnight and 6:00 a.m. She averages one year more schooling, having completed high school and attended college for two or three quarters.

Only about one out of 200 of her sex is caught violating the motor code each year, one out of 33 has an accident, and one out of 30 has an accident or violation recorded against her in the state files annually. It should be noted that these ratios are not constant and may vary with the length of the open season. The accident reporting index went from about 6 per cent to 28 per cent in Iowa with the inauguration of the financial responsibility law in 1948. Most of the records reported here were based on experience prior to that date. A later sampling may change these ratios.*

Significance of Sex Differences

When most of the differences in driving habits and characteristics noted between sexes are subjected to statistical evaluation they are found to be at a satisfactory level of confidence and hence must be considered as two separate phenomena in studies of evaluation or analysis in terms of associated or causal factors.

When mileage is equated some very interesting trends in efficiency of mobility show up. Whereas the male apparently excells in skillful manipulation of the automobile at 15 and above, so far as his official record is concerned in data collected before 1950 his involvement in accidents is higher, when mileage is controlled, up to about the age of 30-32. His sister, on the other hand, improves gradually up to the age of 32-33 when there is a slight upsurge in accident susceptibility during the early thirties. The reasons

*The results are based on 1947, 1948 and 1949 data.

for this are only speculative, perhaps worries over children, interference of small fellow passengers or certain psychomatic changes characteristics of this period of life. The trend then turns downward again until about the age of 55 when there is another upward trend of more or less permanent nature. This may conceivably be a function of the age of learning to drive. Most likely studies of similar nature made ten years later will show different trends. The male, however, holds his own as a driver, on a mileage basis, until about ten years later or about the age of 65 years.

When an overall comparison is made between male and female drivers, on a mileage basis, the latter have a slightly more favorable position from the viewpoint of insurance underwriters, altho chi-square is not significant being only 1.818. This might well be due to sampling error. It would need be around 3.843 to indicate a reliable and significant difference between the sexes in accident involvement.

Younger Males Most Affected

One particularly noticeable feature of the data on male drivers is the erratic behavior between the ages of 17 and 27. This might well be termed a "d'Artagnan complex" by psychiatrists. An estimated 10 per cent of the male driver population (unfortunately not all are accounted for due to the heavy lethal effect) seem to be afflicted with this malady. The characteristic symptoms are of suicidal nature and the tendency is to dash about without respect for persons, conditions or objects. The victims suffer with delusions of clairvoyancy and space distortion, thinking they can see around corners, through vertical curves, rain, sleet, fog or even trees and blank walls. One is reminded of the horse that Rastus sold Sambo. When the latter complained that the horse was blind and walked into trees, Rastus insisted the horse was not blind but just didn't give a darn. The particular etiology of this apparent disease has not been studied but its magnitude warrants serious consideration. A military uniform seems to enhance the symptoms, particularly during week-end periods.

Other Symptoms

Other symptoms of this strange malady which have been observed are excessive spurts of speed of locomotion, sudden and disastrous decelerations, unprecedented swerves, zig-sag motions laterally from the line of travel and an almost pathological phobia of remaining with a group when moving. They tend to forge

ahead and pass others even if the destination is only 200 feet beyond the point of passing.

Gyrations in locomotion of various types and sudden reversal of direction are not uncommon. The victim seems beset by indecisions and contradictory impulsions. The law of gravity seems particularly irritating to the victim and there is no aesthetic or logical appreciation of momentum. The principles of Newtonian physics are particularly irritating at this phase of the disease.

Another symptom is that of following on the bumper of the vehicle ahead. Space judgment seems to be particularly erratic and sporadic stops to reduce the number and severity of contacts made is frequently observed. An abnormal perception of space plus a strong bullying tendency often result in many occasions for concern by fellow motorists moving in the same or opposite directions.

Since the victim is supposedly most affected at the time his physical resistance should be highest, perhaps the malady might be termed "automotive amentia". According to the best psychological theory amentia is congenital and incurable. From the appearance of the data on this phenomenon or disease it would appear that this specific malady of the young male automobile driver is a type of amentia being incipient until about the age of 16, then waxing briskly until the age of 23 after which it wanes gradually until, in most cases, it subsides or disappears at around the age of 32. A few cases persist, like infantilism, and the symptoms never completely disappear. This incurable segment of the driving population often eliminate themselves.

A common symptom of this highly lethal malady of the young male driver is an extreme tendency toward nocturnal migrations at high speed. The victim may travel up to 80-100 miles an hour between 1:00 a.m. and 4:00 a.m. for no apparent reason. The average road speed during this period is 53 miles an hour as compared with a mean of 47 miles for other hours of the day. The percentage of the lower age groups are proportionally higher.

The influence of proximity to the opposite sex seems to amplify the general symptoms under certain circumstances. Hyperagility during the late nocturnal period, however, cannot be explained on such basis since it has been shown that the female is rarely abroad during these hours. If anything her presence might be expected to reduce the rate of locomotion at this hour.

Living Habits

Most mammals spend the greatest part of their industry on

three aspects of their own welfare: (a) food getting, (b) shelter, and (c) procreation and care of the young. Locomotion usually is dependent upon morphological considerations and requires little attention on the part of the parent or offspring.

The particular specimen under discussion differs considerably from others in this respect. A large proportion of his effort at all ages above 16, and much of it before, is spent in improving his means of locomotion or getting about from place to place. Note the interest in bicycles, motor scooters, hot rod activities as well as the more mature desire for possession of an automobile.

Economics Involved

To further emphasize this category of differential characteristics on a comparative basis, the automobile driver invests about twice as much of his annual industry in means of locomotion as he does for protection from the elements, and approximately the same as he spends for food for his entire family. This can readily be calculated, assuming the mileage to be only 12,000 miles a year. The cost of driving an automobile at present prices is estimated at slightly over 10 cents a mile by an outstanding automotive economist associated with the industry. The estimate is most likely to be conservative. A grocery bill of $100 a month is not hard to imagine and certainly $200 a month for rent, fuel, insurance and clothing would not be exhorbitant.

Another characteristic of motor mania in general is the craving for a new vehicle annually. The individual is usually satisfied to stay in the same home or shelter for many years, in fact usually prefers it for sentimental reasons, even though many times outmoded and inadequate. At the same time his means of transportation must be the most modern and "shiny" model available. It must also be powered for speeds three times that required for safe locomotion. It must carry numerous expensive gadgets, and be given the finest mechanical care, even if the family wardrobe is shabby, the life insurance cut or dropped and dental or medical care suspended.

Lethal Effects Considered

Although highly beneficial to mankind in many respects, as an auxiliary aid in his industry, the automobile has a marked detrimental effect to the driver himself and his nonmechanized fellow creatures. Hazards of man's industrial, recreational and locomotive activities stand high in the causes of premature death and injury. Latest figures from the National Safety Council show the

following facts in this respect. Automobiles are responsible for over one-third of all deaths and injuries to the species. Last year there were over 38,000 motor vehicle deaths alone and a total of 100,000 accidental deaths in the Unitel States. Over a million others were injured and 400,000 permanently maimed and rendered partially dependent on the national economy. The economic loss from all accidents is estimated at about $7,900,000,000 annually, a sufficient amount to amortize the national debt in something like 30 years. Iowa alone sustains an annual economic loss of around $25,000,000 due to automotive mishaps as shown from state records.

Young Suffer Most

The most serious part of the problem is the high mortality rate among the young. Man has largely offset the inroads of children's diseases by application of scientific efforts and medical advancement, but accidents (from automobile and otherwise) stand highest in the list of causes of death to young people. A careful digest of Table 1 will illustrate this point.

Table 1

Causes of Death to Various Age Groups
Accidental Deaths of all Kinds
(Traffic causes over one-third)

Age		Rank
Under one year of age	Accidents	Seventh
1-4 years	Accidents (Pneumonia second)	First
5-14 years	Accidents (Cancer second)	First
15-24 years	Accidents (Tuberculosis second)	First
25-44 years	Accidents (Heart Disease second)	First

Although dropping to some extent in rank as age increases, accidents still stand third as a cause of death to males and fifth as a cause of death to females at the adult level. Below the age of 30 accidents stand first as a cause of all deaths in the United States.

Possibilities of Changing the Driver's Characteristics

It would not be in order to pose a problem of such broad ramifications without offering some suggestions or possible avenues

of solution. In fact the situation is not as futile as it has been made to appear. Some progress has been made. The chances of a fatal accident per mile of travel today is only one-third of that expected three decades ago, even though average road speeds have increased about 20 miles per hour and traffic is much more congested. This improvement is perhaps due primarily to four factors; (1) better trained drivers, (2) better roads, (3) better cars, and (4) better laws, regulations and enforcement. The proper weighting of these four is difficult to establish.

Classification of Undesirable Driving Habits

Much could be done to improve driving habits that would help make our highways safer. Habits of driving, good or bad, fall under three general categories of classification:

A. *Those relating to skill at the wheel.* Improvement in this respect can usually be accomplished by better training of drivers.

B. *Those relating to more nearly complete knowledge of driving, driving conditions and habits of defensive driving, as well as demonstration of the ability to apply this knowledge.* Both training and experience are important factors in attaining this objective.

It would presuppose a much better preparation of each driver before he received a license. In what other area do we license persons to practice, then police the licensees into correct performance on the job? Isn't the cart before the horse? The driver's license examination should be much more rigid and should require a good working knowledge of the fundamentals of safe driving.

C. *Those relating to attitudes and courtesy on the highway.* Most accidents could be prevented by careful observation on the part of the driver and the practice of common courtesies as are observed by pedestrians when meeting or passing on the sidewalk.

Somewhat less than 5 per cent of drivers are classified as accident prone. Approximately 25 per cent of the population only have accidents occasionally and are classified as accident susceptible. Seventy per cent of all drivers do not have accidents within a 10-year period. This is reasonable evidence that the other 30 per cent could avoid most accidents which occur and thus reduce the death toll from traffic by a large amount.

Some Fallacies in Thinking Which Must Be Corrected

There are several fallacies of thought that will need be corrected before automobile driving and highway travel can be brought to the maximum point of safety. Experts now consider it theoretical-

ly possible to achieve, under present driving conditions, a reduction of about 30,000 fatalities a year. This would mean 8,000 motor vehicle deaths rather than 38,000 annually.

Some common false thought habits may be enumerated as follows:

1. That accidents happen according to the law of averages. This is neither scientifically sound nor experimentally true.

2. That one is powerless to avoid an accident if his "number is up." The acceptance of this tenet would render most of man's efforts at self preservation useless.

3. That past record and success guarantee immunity from accidents. A large proportion of fatalities occur with the first accident experience.

4. That it will only happen to the other fellow. It can't happen to me is a very dangerous attitude. This self-induced personal philosophy is highly lethal if followed consistently.

5. That good roads and safe cars will eliminate accidents. Over 90 per cent of all accidents are attributed to the driver. New cars and even superhighways often show greater association with motor vehicle fatalities on a mileage basis than would seem warranted.

6. That drivers can be trained too young. There is more evidence to support the opposite point of view.

7. That normal roadside developments, business, objects of interest and advertising signs increase accidents. All the evidence is on the opposite side. They seem to aid in providing necessary conveniences to motorists and also tend to keep the driver alert.

8. That all accidents are caused by *one group of drivers, one type of conditions, or one set of circumstances.* The *one remedy* theory has long been discredited.

9. That persons can be policed into safe driving habits. No state or commonwealth could afford enough patrolmen to eliminate reckless driving entirely. Each driver on the highway must be his own policing officer or agency. Proper training before licensing would greatly aid in reaching this objective.

10. That accidents are the price of progress. Nothing is farther from the truth. Newer industries of all types have by far the best safety records on the average. Accidents, with rare exceptions, begin and are consummated in the mind. External conditions and circumstances are only contributory influences which merely sets off the accident-potential situation.

General Summary and Conclusions

In this short discussion an attempt was made to summarize the data on characteristics of the automobile driver in such a way as to focus attention on the problem. Further, an effort was made to suggest the basic principles of accident prevention which would lead to an alleviation of this scourge to society. It is literally much worse and devastating than War.

If this paper has seemed somewhat informal at times, it has been in the interest of brevity and economy in time. A scientific approach to the problems of driving will eventually provide a body of working knowledge that should practically eliminate motor vehicle accidents.

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Iowa State College
Department of Psychology
Ames, Iowa