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SOCIAL AND CULTURAL FACTORS

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SOCIAL FACTORS RELATED TO ACCIDENTS may be studied on the societal or on the individual level. From the societal point of view, broad social forces influence the ways in which the community or group views and deals with the hazards in its environment. Research on this level is concerned with such phenomena as the social and cultural forces which favor accident occurrence; the priorities given to the control of firearms, vehicular traffic, and poisons; the economic forces which resist the adoption of recognized safety measures, such as railroad air brakes and automobile safety belts; and the political pressures for and against safety legislation.^{1,2} Although they are to some extent removed from the direct causation of accidents, such factors are clearly significant.

From this broad point of view, accidents may be studied as a manifestation of social pathology. They are dysfunctional to the social system, interfering with its smooth operation, and they reflect and create social problems that involve most if not all of society's institutions—industry, school, home, and government. They also mirror a society's technology and the ways in which it has been integrated with its environment. For these reasons, one emphasis of behavioral research on accidents is their study as social phenomena, in much the same way that suicide, crime, and various diseases are studied in relation to the characteristics of social groups which favor their occurrence. The research worker using this approach attempts to determine the cultural and social values that influence the occurrence of accidents, the role that accidents play in social disorganization, and the institutional forces that positively or negatively influence their prevention or control.

From the individual point of view, the social scientist is interested in those social factors that affect the individual's behavior in relation to environmental hazards. Since almost all individual actions have social components, social factors may greatly influence not only the occurrence of accidents but also their type and severity. Individuals belong to groups, and group pressures may substantially determine whether individual behavior results in accidents to the individual or to others. The emphasis on vehicular speed and appearance rather than on crashworthiness (see Chap. 9) is an example of a group value. Social drinking patterns are largely group controlled. The individual who takes unnecessary risks may be trying to impress his fellow group members and, in fact, risk-taking may become a recognized and accepted group norm.

In addition to belonging to groups, all individuals occupy certain statuses and perform according to prescribed roles. All of these may impinge upon individual attitudes and behavior in regard to accidents. How well the mother and father perform their protective role in relation to their children may have a great effect upon the accident rates of their children, as the work of Read *et al.*³ and others has demonstrated. Certain occupational statuses subject individuals to unusually high risks in the performance of their work. The individual's roles and statuses define who he is and what is expected of him; to the extent that safe behavior can be made an appropriate and acceptable part of his role performance and commitment to his status position, he will tend to incorporate it in his everyday routine.

Although much research has been done on the influence of social factors on a wide range of individual behavior—voting, for example, or purchasing habits—few studies have been done on accidents. Since accidents are usually not predictable and therefore not observable in systematic fashion, such studies may have to go back one

step and examine the more readily observable behavior that precedes the accident. Thus one might study such accident-generating acts as driving when drunk, speeding, jaywalking, and leaving a baby unattended.

There is an almost complete lack of significant studies which bring to bear on accident phenomena the full force of social theory and method. The few examples reproduced below are quite elementary and are offered to illustrate what might be done rather than as good examples of what has been done. We begin with Foote's thoughtful and highly original analysis of the potential of community, institutional, and interpersonal factors in both accident causation and prevention. As Foote points out, many institutional forces in society today indirectly promote the occurrence of accidents.

Foote's general analysis of social factors in accidents is followed by a detailed formulation of a theory of "the social threshold" in accident causation. Viewing accidents as a form of deviant behavior, Paterson hypothesizes that there is a threshold of conforming behavior beyond which an individual ventures into accident-inducing situations.

Bringing together a number of studies, McFarland and Moore appraise the many social factors related to automobile accidents involving young people. Especial significance is given to the role of the automobile in the life of the young person; it obviously serves many functions besides transportation, and many of these increase its potential for causing accidents. In the next article, Case and Stewart review the literature on driver attitudes but find that current tests are inadequate to measure the full range of driver attitudes and the effect of these attitudes on accidents (see Orleans and Ross, Chap. 5). Backett and Johnston's study deals with social factors, such as family background, in relation to childhood pedestrian accidents. Accidents outside the home are found to be related to the characteristics of the home, thereby suggesting that social factors may carry over into situations beyond their immediate environment.

On a completely different level of analysis, a sociologist, Porterfield, dealing with suicide, homicide, and crime, shows that these evidences of social disorganization are statistically associated with the occurrence of accidents. At the same general level of analysis, Ross raises the possibility that attitudes toward traffic laws are a dysfunctional element in traffic safety.

Finally, we examine behavioral factors in relation to accidents in which alcohol plays a role. Although several studies have firmly established the importance of the pharmacologic effects of alcohol in the initiation of accidents, only a few have begun to unravel the pertinent behavioral correlates of its use. Increasingly, however, attention is being directed to factors of this type. The problem of the drinking driver, for example, includes such behavioral components as: (1) cultural patterns in recreation, business, courtship, and entertainment; (2) public attitudes; (3) economic and political forces that favor drinking;^{1,2} and (4) the emotional needs of the individual that favor his use of the drug.* Further, since the chronic alcoholic is now known to

* Authorities have long regarded beverage alcohol (ethyl alcohol, ethanol) as a drug and do describe it thus in the scientific literature. A committee of the WHO has stated that it has properties "intermediate between the addiction-producing and habit-forming drugs."⁴ Although not all problems associated with its use can be described in relation to its pharmacologic properties, it is important to remember that lacking these properties it would not be employed.

be disproportionately represented in drinking-driving accidents (see below), the behavioral factors of this common disease are also important in relation to accidents.

Although there have not been many pertinent investigations, the reports by Barmack and Payne document well the importance of the accident-involved drinking driver's social background. Their findings and our general knowledge of the significance of alcohol in accidents make it clear that the successful control of the drinking driver will require far greater knowledge than we now have of the behavioral factors associated with its use.

SOCIOLOGICAL FACTORS IN CHILDHOOD ACCIDENTS

—*Nelson N. Foote, Ph.D.*

Beginning with a simple description of the distribution of fatal accidents among children, Foote presents a sophisticated discussion of institutional, interpersonal, and individual factors that favor their occurrence and prevention. He states that "from the standpoint of accident prevention, the elimination of hazards through institutional action must realistically always remain the primary grand strategy." He also points out that "wherever well-recognized and widespread hazards in the physical environment remain year after year, it takes very low-powered research and little of it to discern that powerful institutional interests support their continued existence," and adds that "the appropriate question in such cases is: Who benefits from the maintenance of the hazard?" Such questions are well known to sophisticated workers concerned with accident research and prevention but are rarely, if ever, stated publicly. They point, nevertheless, to many opportunities for research of particular interest to behavioral scientists.

On the interpersonal level, Foote brilliantly discusses the role of parents in the injuries their children sustain and points out that many "accidents" are in reality the results of deliberate aggression.[†] This emphasizes the point that there has as yet been no adequate study of the relationships—undoubtedly numerous—between inadvertent injuries and those deliberately initiated. Forensic pathologists and some accident research workers, particularly those who study accidents rather than such secondary sources as accident reports, are quite familiar both with homicides and suicides classified as accidents and—though they are probably more rare—the reverse.² In addition, it is likely that individual accidents may be in part both inadvertent and deliberate, as Selzer's exploration of suicidal tendencies among alcoholics and others involved in motor vehicle accidents suggests.⁵

In regard to individual factors, Foote urges that social variables be considered before personality factors and the notion of accident proneness are employed as explanations of accidents. (We have already noted, in Chaps. 5 and 7, the limited usefulness of the latter emphasis.) Foote also proposes an analogy between accident

[†] Although long recognized on the basis of individual clinical cases, the occurrence and characteristics of such injuries are beginning to receive increased attention from the medical profession.⁶

behavior and delinquent behavior and points out that it is likely that "any strategy for prevention offers more hope to the degree that it employs generalized social controls rather than resorting to individual therapy of variable efficacy." Although he is probably correct in this view, this is one of the many points with respect to accident prevention that need careful consideration and thorough study.

Foote concludes with an outline for an interesting laboratory test of risk-taking among children, involving the observation of the behavior of children under a series of real-life situations of risk, such as crossing a road, hammering a nail, and climbing a tree.† Especially if the results were shown to correlate with accident distributions among the same children, such a test might be used to identify those who exhibit potentially dangerous patterns of risk-taking. Granted that there are difficult problems of standardization, control, and interpretation, experimental approaches of this general type might do much to provide needed information that is not being produced by most current accident research.

SUCHMAN AND SCHERZER's *Current Research in Childhood Accidents* cites the following data from the National Office of Vital Statistics, showing frequencies of the main types of accidental death by broad age groups during 1956:

TYPE	AGE	
	Under 5	5 to 14
All types	8,173	6,316
Motor vehicle	1,770	2,640
Falls	427	188
Fire burns	1,158	667
Drowning	748	1,327
Railroad	76	148
Firearms	79	429
Poison gases	53	33
Poison except gas	394	32
(All other— by subtraction	3,468	852)

Because of the special care taken with mortality statistics, these are probably among the most reliable data obtainable from official records of any kind. And because accidental deaths are even more rare events than accidents, data drawn from the complete national universe deserve thorough analysis. It is not clear how thorough such analysis has been.

For example, the table above exhibits several suggestive relationships. If the

5-to-14-year column is calculated as a series of percentages of the under-5 column and ranked in ascending order, an interesting sequence results:

	Percent
Poison except gas	8
(All other	25)
Falls	44
Fire burns	58
Poison gases	62
(All types	77)
Motor vehicle	149
Drowning	177
Railroad	195
Firearms	543

Three speculative hypotheses emerge from this ordering: First, the number and variety of hazards in the physical environment of the adult are much greater than in the segregated physical environments designed for the child. Secondly, those accidental deaths that represent failures in parental protection from the dangers in the physical environment diminish as the child learns to care for himself. Finally, those accidental deaths that represent risk-taking with known dangers in his physical environment increase as the child's range of exploration increases.

The extreme concentration of accidental deaths in the first year of life, and the very

[Reprinted from *Behavioral Approaches to Accident Research*, Association for the Aid of Crippled Children, New York, 1961, pp. 121-135.]

† See Chap. 3 for a study of responses to a "visual cliff" and Chap. 10 for a study of behavior in relation to entrapment in refrigerators. Other examples, with adult subjects, have chiefly involved driving in relation to drinking (see Chap. 3 and reference 7).

high accidental death rate during the second year, underline the degree to which such mortality is a function of dependency on parents and other guardians. For each type of death, it should be possible to draw from existing statistical data its characteristic curve of frequency by years of age. Ideally, this would break down the first year into months. Such a refinement of incidence figures, including finer categorization of the agents of death, and time series comparison, should yield further clues as to the dynamics of parental care and child development in relation to the dangers of the physical environment.

A further examination of the table above discloses that the most prevalent types of accidental death arise from highly familiar hazards: collisions, from moving vehicles; drownings, from water; burns, from fire or heat; asphyxiation, from gas; shootings, from guns. Just as conceptually it is clarifying to separate the accident as an event from the injury which may or may not result, it is helpful in conceiving future research to isolate the hazards of the physical environment from both accident and injury. A child who falls from a high place may be crushed, drowned, burned or suffocated, depending on where he falls. The height is one hazard; what lies at the bottom may be another, and both can potentially be dealt with, as in the use of landings to interrupt long flights of stairs.

INSTITUTIONAL FACTORS

Any sociological approach to childhood accidents should take extensive account of the kinds and distribution of hazards in the physical environments of children. Especially in the United States, these physical environments are rarely natural, and even those that are natural tend to be deliberately selected, segregated, and assigned for use by children. Most are artificial, although it would be a mistake to suppose that most have been designed for the safety of children.

From the standpoint of accident prevention, the elimination of hazards through institutional action must realistically always

remain the primary grand strategy. Educating parents to provide hazard-free environments and protection will always remain quite secondary, though perhaps more effective than training children themselves to avoid risk. The Underwriters' Laboratories, for example, keep childhood deaths by electrocution at such a minimum that most parents hardly regard electric cords, receptacles, and sockets as hazards at all.

From the institutional point of view, time series analysis of types of accidental death should disclose many readily understood trends in incidence based on historical increases and decreases in the incidence of specific hazards. The decline of gas lighting and the redesign of valves on gas ranges have probably diminished the frequency of asphyxiation despite increased numbers of homes using gas. The rapid increase in backyard swimming pools, however, appears to be multiplying child drownings in suburban neighborhoods faster than institutional protections can be erected.

Perhaps the most intriguing hazard for sociological research implied by the foregoing list is firearms. In the 5-to-14-year-old category, shootings rank fourth after automobile accidents, drownings, and fires as causes of death. Some children no doubt shoot themselves, and some are shot by their parents or other adults, but it seems likely that most children are shot by other children. If that is true, the problem of defining the nature of an accident is very much complicated thereby. Legally, of course, juvenile criminals are not held responsible for their actions as adults are, but, from a psychological point of view, pointing a gun at another child and pulling the trigger is very different from being struck by lightning while swimming in the rain. To whom has the accident happened in this case? Here accident and injury are indeed separate entities to consider. Apart from the interpersonal aspects, which will be dealt with later, the most interesting institutional aspect of firearms as a hazard is the possibility that in this case the community fosters shootings.

Much controversy has raged among television producers and their critics as to the effects of the profuse portrayal of violence in gangster and western melodramas. If, to the statistics on child shootings which end in death, could be added the many more shootings which do not, perhaps they would constitute a hard and objective index by which the students of mass communication could at last measure effect.

The leading type of accidental death, by motor vehicle, breaks into a multitude of subtypes when considered sociologically. Because in any motor accident involving a child it may be assumed that the child is not a driver, several other persons have to be taken into account, starting with at least one driver and one guardian of the child. Interpersonal relations tend to be patterned along institutional lines, as will be seen presently.

Meanwhile it is evident that simply as a physical hazard, apart from interpersonal relations, the moving vehicle represents a conflict of values which positively obstructs accident prevention. Speed limits low enough to make the automobile less lethal are notoriously difficult to enforce. Likewise efforts to exclude pedestrians and cyclists from roads bearing auto traffic have succeeded only on a few toll roads and express highways, not on city streets. The city planning and architecture which put sidewalks next to pavements have frozen into concrete and stone an institutional assumption that those who walk are of less importance than those who drive. The millions spent on steel for protecting motorists at every turn in the highway are not matched by comparable expenditures on physical protection for pedestrians. Pedestrian bridges over heavy traffic, like those which cross the Lake Shore Drive in Chicago, are almost oddities, and even these were installed not for the sake of pedestrians but to keep traffic flowing continuously. Perhaps someday, when vehicular congestion on Manhattan Island becomes still greater, the sidewalks will be removed altogether in order to widen the streets. Elevated walks for pedestrians may then be extended from the

second floors of buildings. The physical separation of pedestrians from motor traffic, which the architectural prophets have preached for many years, is much more likely to come about in order to make more room in the street for automobiles, however, than through concern for pedestrian safety.

Indeed, wherever well-recognized and widespread hazards in the physical environment remain year after year, it takes very low-powered research and little of it to discern that powerful institutional interests support their continued existence. The appropriate question in such cases is "Who benefits from the maintenance of the hazard?" Who benefits from the steady display of violence on television? Who benefits from firetrap housing? Who benefits from wrapping goods in thin plastic film? These may or may not be legitimate research questions. In programs of action to circumvent powerful institutional interests, it is sometimes possible to bring other powerful interests to oppose them. Ascertaining potential counterinterests may also be an investigation that would not be recognized as accident research.

It is the customary claim of publicly supported, nonprofit institutions that they exhibit a nonpartisan, public interest rather than a private and partial or partisan interest. The most popular *raison d'être* for foundations in the United States, for example, is child welfare, in the abstract. Bodies of this sort are given to research instead of reform. The old style of zeal which animated leaders in the political struggle against child labor is regarded by them as unscientific and unbecomingly partisan. In overcoming institutional opposition to the removal of hazards, however, to borrow a phrase from General MacArthur, there is no substitute for victory.

Further to trouble those who shrink from recognizing that progress in accident prevention is not postponed primarily because of lack of knowledge, it may also be noted that exposure to hazards tends to be concentrated among children whose families are shortest of economic power. These are

the families whose children must play in the streets, swim in excavations, and rustle their own meals while their mothers work to pay the rent. Although no parents can entirely control the physical environment of their children, there is enormous variation in their relative ability to do so. Any program of accident prevention thus ultimately runs up against the differential distribution of safety in society, as a concomitant of wealth and poverty.

In any evaluation of the potential contribution of research to accident prevention, therefore, it is not far-fetched to contemplate the possibility that research can actually make matters worse, by diverting attention from the basic task of removing hazards or by serving to postpone action. It is conceivable, on the other hand, that some kinds of research could be developed which would shed light on the process by which a few members of society continually emerge who seem as moved to seek justice for others as for themselves. Many of the institutional safeguards which already exist have been erected by such champions. Research into the institutional factors that account for the persistence of major hazards or disclose insights into the organization of means to remove them, however, is bound to seem further removed from recognizable accident research the more basic it becomes.

It is very likely that accident research in any form that will be recognized as proper by sponsors affecting an impartial public interest will simply concede the differential distribution of institutional hazards to child safety and thereafter ignore them. The unequal distribution of hazards will nonetheless repeatedly prove inconvenient in drawing generalizations about accident causation and prevention, because it confounds the correlations that might otherwise be found between the characteristics of children or parents and the frequencies of accidents. So even from the narrow standpoint of research exclusively on personality factors, it would be very helpful if an economical checklist of hazards in the physical environments of

research subjects could be developed, so that these hazards could be at least experimentally "controlled."

INTERPERSONAL FACTORS

In considering other persons who play important roles in childhood accidents, parents obviously deserve most attention. Injuries of children traceable to mistakes or aggression by their parents are many. By contrast, young children rarely injure other children. They do so more often as they grow older and approach adult status, the climax of their malignancy being reached when they become parents themselves. As the table at the outset showed, children are most vulnerable when they are most dependent. As they become more and more independent of their parents, they are less vulnerable to accidents and injuries caused by their parents, although they are simultaneously exposed by their own growing capacities for movement and exploration to injury by other persons outside the home.

Since we are largely concerned with physical relations among physical bodies, it should not seem surprising that small bodies suffer most from large bodies, or that such injuries diminish as body size is equalized. It nonetheless seems contrary to traditional moral expectations to recognize that parents do not, on empirical examination, appear uniformly as protectors of even their own children.

A Danish criminologist who some years ago collected statistics from several European countries on murders and murderers found that generally murderers were closely related to those they murder. One is safest with total strangers, and most in danger from husband or wife, parent or child. Every day the newspapers carry tales of clubbings, stabbings, shootings, burnings, strangulations, drownings, and starvation of children by parents, in this country as in all others. Such mayhem, a certain portion of which results in deaths, is so commonplace that its extent is not recognized. Moreover, most of it goes unreported, since it does not

come to the attention of the police. No formal study of domestic crime has ever been made. It would seem prerequisite to have such a study in order to differentiate, at least crudely, deliberate injury from accidental injury to children. This is because the claim that deliberate injuries were accidental is one of the commonest defenses of parents who are charged with maiming or killing their children. It cannot be taken for granted that accidental injuries will necessarily be found to outnumber deliberate injuries except in certain specific categories.

These observations about deliberate injury to children by parents do not include those apparent accidents which some would readily attribute to unconscious hostility on the part of parents. Moreover, drawing a line between deliberate and accidental injury of children is complicated not only by unconscious motivation but by the legitimacy with which society continues to sanctify corporal punishment of children. Corporal punishment of adults (who are presumably far more responsible for their actions) has been abolished in most civilized regions of the globe (except for the ultimate form, capital punishment) but has apparently nowhere been abolished for children. In most families it appears to begin before the child has learned to talk, and it continues until he is big enough to defend himself against it. In general it is levied without respect to the child's capacity or degree of responsibility and, indeed, usually seems to serve as a substitute for those means of discipline that would cultivate higher degrees of responsibility.

David Susskind remarked recently, "Violence is the last resort of an exhausted mind." Most parents are unaware of any alternative to its use in controlling their children, and society furnishes them little example or instruction in these alternatives. And ironically, those who are most its victims are most likely to perpetuate its practice from generation to generation. At the same time, there is a chronic undercurrent of bad conscience over it, which gives rise to its

vehement advocacy on the one hand while leading to its concealment on the other.

Injuries inflicted under the pretext of punishment are therefore difficult to detect except in the most flagrant cases, such as those that result in death or serious mutilation. Nonetheless, in determining where deliberate injuries leave off and "genuine" accidents begin, much more than is known at present needs to be known about the incidence and prevalence of corporal punishment. Meanwhile, aspiring more modestly, if somehow the frequency of childhood accidents could be associated in future research with only a crude and simple distinction among parents as utilizing corporal punishment at all or not at all, it is possible that some solid clues would be uncovered as to those kinds of injury that more often arise from deliberate parental aggression. This kind of distinction between types of child-rearing practices may well prove more discriminating as an independent variable than such distinctions as permissive-authoritarian.

Once the practice were established of gathering information on the parents as well as on the child in each accident case, as is nowadays done in sophisticated child guidance work, many additional independent variables or characteristics of parents might well be studied. For example, do younger parents have more accidents with their second and younger children than with their first? Again, what kinds? Is there any difference in the protectiveness given by parents who were themselves older or younger siblings or "only" children? Even such simple, demographic information, if fully analyzed, would apparently add substantially to existing knowledge on the roles of parents in childhood accidents. It is cheap and easy and reliable to ascertain, but only as a first step toward fuller data. The time may never come, however, when, even on a sample basis, parents of accident victims are given psychological tests. Meanwhile, if something could also be ascertained through official records about the accident histories

of the parents, in a form that would permit their association with the accidents of their children, some clues might emerge as to whether and how certain types of accidents are transmitted as a cultural pattern from one generation to the next.

From sufficient scrutiny of the associations between parental characteristics and childhood accidents, there should emerge some indications as to what kinds of action might be taken with regard to parents that could potentially alter the frequency of accidents among their children. The easiest and most obvious form of action is, of course, the purely informative kind of action that makes them aware of the existence of hazards in the environment of which they were previously ignorant. Education of this sort probably would make little difference in accident rates. There is such a ceaseless, autonomous flow of such information in the course of normal communication among people at large, hazards and accidents being standard conversation pieces and news-gathering fare, that accidents to children are rarely the result of the ignorance or naivete of their parents.

Apart from overt or disguised aggression, parents, like children, contribute to accidents primarily by the ways in which they deal with known hazards. Training in safer forms of behavior is thus not the imparting of elementary information so much as it is basic re-education, a restructuring of existing patterns of behavior. And here, of course, the ancient question arises as to whether education can be as effective in establishing new patterns of behavior in the later years as in the earlier years. Possibly it can; possibly, as with crime and delinquency, which also reach their peak somewhere around age twenty, the malignancy of parents in causing accidents to their children recedes from early adulthood onward.

To turn from the role of parents in childhood accidents to the role of nonparents is not to turn far. Since few childhood accidents can be attributed to other children, "nonparents" means other adults, and most of these other adults are or have been parents

themselves. They have also been children at an earlier time and, therefore, have embedded in their experience some acquaintance with protective behavior. Certain basic research questions thus arise from considering why and how it is that all adults do not exercise the same degree of protectiveness toward other children as they exercise toward their own—however much or little that may be.

The first and most obvious hypothesis might be that some have had no children of their own; the second, that they are hostile or uncaring toward their own; the third, that they take great risks with their own. (Classification of these other adults would seem an elementary step in research, although it probably has not been done.) After excluding all such categories, however, there will still remain a certain fraction of parents who are quite affectionate and protective toward their own children but hostile or uncaring toward other children. It is by studying these that the influence of institutional factors in designating the children of various out-groups as of less importance than the children of the in-group comes again into view. Even given the maldistribution of wealth, with which safety can be to some degree purchased, there is an additional influence on the differential distribution of childhood accidents arising from the fact that some children are less valued and therefore less protected by other adults than these other adults protect their own children.

The most overt evidence of this differential in protectiveness is the visible difference in police and fire protection given various neighborhoods of a city, but the workings of social stratification are equally visible on playgrounds, in schools, and especially on the streets. Consider the opposition which arises to every public move to provide protected play space for children whose parents cannot provide it. Or, for ease in enumerating the organized groups which represent the antichild interest in every community, the researcher may simply list those which come forth more

regularly to oppose school bond issues. It may very well be that a greater contribution would be made to reducing childhood accidents by altering the tax laws than by any program of safety education imaginable.

If it can be established that there is a positive correlation between the affection of parents for children and the protectiveness they exhibit, another large institutional matter also looms into view, where perhaps there is more room for optimism than with respect to achieving a closer approach to civic equality. That is the matter of voluntariness of parenthood. In the past, it appears that more people had unwanted children than is true now, thanks to technical progress in contraception and to diffusion of knowledge and means of contraception. Should this be true, and should the trend continue, and should it also be demonstrated that children wanted in advance receive more affection and protection than those who are unwanted, it would then seem logical to expect that future generations will on the average receive more care than have past generations. Research on planned parenthood might thus make an appreciable contribution to childhood accident research. The question of whether children loved by their parents do in fact have fewer accidents than those who are unloved is a very open one, however, and moves into the social psychology of the self.

INDIVIDUAL FACTORS

In trying to explain individual differences in behavior, refuge is too often taken in the concept of personality before the social factors involved have been fully explored. The concept of accident proneness appears to be a particular version of this tendency to overpsychologize problems of explaining behavior. Only when all the confounding influences of differential exposure to hazards, differential rates of accidents of various types at each age level, and differential distribution of parental and civic protection have been fully taken into account would it be logical to designate one person as more accident prone than another. And even if

it were possible to isolate some individuals who were demonstrably more accident prone than others, such individual differences might still be accounted for by the differential distribution of social influences other than hazards, age status, and protection. Statistically, not many social factors need to be taken into account simultaneously before the number of individuals subject to any specific combination of these is reduced to a very small number, such as one.

Perhaps the most illuminating analogy to accident behavior in children in this respect is delinquent behavior. Under what appear at first glance to be similar social circumstances, two boys in the same family may turn out quite differently, one engaging in criminal acts while the other abides by conventional rules of moral behavior. Without venturing into the controversy that still continues between sociologists and psychiatrists, it does appear likely that any strategy for prevention offers more hope to the degree that it employs generalized social controls rather than resorting to individual therapy of variable efficacy. Social science best serves social policy and practice when it performs its obligation to generalize.

At the level of the individual self, therefore, one may begin to seek generalization by starting with the concept of the social self. In an article in *Sociometry*, Morton Deutsch establishes experimentally that there are substantial differences between the behavior of people who like themselves and people who do not. The basic hypothesis appears to hold much promise for childhood accident research—at least for accidents among children old enough to possess a self which they like or dislike as an object.

The normal social environment of every individual from birth onward consists of persons who ply him with a steady rain of admonitions to take care of himself, and who reinforce these with overt actions of protection. Even hostile parents tend to express their hostility in isolated incidents, while habitually exhibiting the same standardized responses of averting injury to themselves and others.

The mythical instinct of self-preservation is another term for this universally learned habit of physical care of self and others. As a consequence, most people find suicide unimaginable and shocking, although it is one of the most human of acts, one of which no animal is capable, and close to 1 percent of adults in civilized societies die by their own hand. Suicide as a cause of death runs more than double the homicide rate, another instructive statistic. The findings of several sociologists since Durkheim of associations between suicide rates and ethnic, religious, and other kinds of social status may be repeated for exposure to self-injury of lesser kinds.

When any person knowingly takes risks with his personal safety, exposing himself deliberately to recognized hazards, he is very likely to provoke strong emotional and habitual reactions in himself and in others who witness him doing so. The many considerations which motivate his actions may occur in varied and complex combinations from person to person, and thus defy generalization. Nonetheless, it is evident in each such episode that he is both exhibiting a generalized attitude toward himself—is indicating how much value he places on his own preservation—and he is testing the response of the other—is finding out how much value the other places on him. For many children who wonder how much they are loved, taking chances thus becomes a way of provoking a caring response. Sometimes the daredevil is seeking the affection of his parents, sometimes of his peers, sometimes both. When minor risk-taking or minor injury fails to evoke the desired response, stronger measures often ensue. Bandages in the schoolroom are badges which win attention and admiration. There may be random factors determining which children seek attention through clowning and which through risk-taking. There may also be random factors determining when risk-taking overreaches intent and injury results, as in the attempted suicides by women in later life which accidentally succeed. But the structure of the inter-

personal situation remains the same, and, as Deutsch suggests, it may be possible to designate children rather definitely as those who care for themselves and those who do not, those who identify with others who care for them and those who identify with others who do not. Although it may be impossible, because accidents are rare events, to find individuals who are demonstrably accident prone, it may be possible to distinguish children who like themselves from those who do not, and to check accident rates in the aggregate for both groups. Whether this could be done by some kind of verbal psychological test, however, is doubtful, especially at young ages, but a behavioral test does seem feasible.

For those whose taste runs to laboratory experimentation instead of study of the real world, the following test of risk-taking is proposed for use with children who are old enough to be absent from their parents and take care of themselves to a greater or less extent. Accidents below this age can be attributed to risk-taking by their guardians, who can perhaps also be tested, as will be seen.

The main element of the test is a standardized situation containing a series of familiar hazards closely analogous to those to which children are exposed in real life. Under the pretext that he is being tested to ascertain whether he would be a "good camper," the child, accompanied first by the experimenter, would be conducted through a physical setting in which he would: (1) cross a road; (2) climb a tree; (3) cross a stream by walking across a fallen tree; (4) add paper or wood to a fire; (5) cut an apple in two with a knife; (6) fire a toy gun at a target in company with other children; (7) be offered water to drink out of a rusty tin can; (8) drive some nails with a hammer; (9) climb up a rocky hillside; and (10) walk behind a row of cars in a parking lot.

Observations of his approach to each of these hazards would be recorded. The development and refinement of appropriate categories for recording would, of course, have to be part of the basic research to de-

velop the test as a reliable and discriminating measuring instrument. The ten items listed above would be subject to improvement also. Norms for the various age levels could fairly rapidly be established, and care could be taken to assure that all subjects recognize the hazards to which they are exposed as constituting hazards.

For the sake of validation, and for controlling learning effect, the same sequence can then be repeated by having a parent accompany the child through the same course of hazards. In this case, if it were of interest, the way in which the parent conducts himself in caring for the child could also be observed. And, finally, the child could be asked to retrace the same course alone, although within the observation range of the experimenter, or two children could be sent through together.

Instead of being forced to deal with such rare events as real accidents (although the test might itself produce a few minor ones), the experimenter could discern a variety of styles and degrees of risk-taking and its hypothetical converse, care for self.

The scientific values of perfecting such a standardized test need only be mentioned. Test performance could be compared with real-life performance, in order to ascertain the predictability of accidents from risk-taking. Verbal reports could be checked against actual test behavior. Cohorts of children could be compared over time, to note patterns of change in risk-taking behavior. Safety education could be evaluated for its effectiveness in changing behavior. The concept of accident proneness might be found to have validity in some circumstances. The uses of such an instrument are probably infinite in terms of their potential applications. And since this kind of research is extremely popular, a sponsor of accident research might have to do no more than support the creation of the test in order to stimulate a much larger number of studies using it.

The fascination of testing, however, could easily submerge the theoretical consideration on which it is being proposed, that a valid

way be found to generalize the care taken of his body by the individual. Applications of the test to large numbers of subjects might very well, in fact, submerge interest in the individual, as has ironically happened often in past research. A single measurement does not describe an individual forever. For example, guided by interest in the development of the individual's attitude toward himself, and assuming that the test shows no uncontrollable practice effect, repeated testing of the same individual at short intervals, between which the outside events occurring to him are ascertained, might show that his attitude toward self, and hence his vulnerability to hazards, fluctuates with the course of interpersonal events. For example, after children have been punished or reprimanded or otherwise made to feel unworthy, they seem to become more frequently subject to accidents. If the test could be refined to a high degree of sensitivity, it might be incorporated into experiments in which children subjected to loss of self-esteem were compared with children subjected to enhancement of self-esteem, partly just to check our basic hypothesis but partly also to learn how the enhancement of self-esteem might be introduced as a component of safety education.

Some of our own previous work on the development of judgment through practice in handling hypothetical situations in small practice groups perhaps makes a contribution to childhood accident research at this point. If accidents are conceived not as unplanned but as the consequences of poor planning, then the cultivation of judgment and good planning might be one road toward their prevention. In brief, what was found in our experiments in the development of judgment was that judgment improves as a person identifies with a good adviser and takes the role of this good adviser toward himself when making a decision. Representative scenes were enacted before a quasi-family group of fellow-experimenters, in which one actor was an advisee and another was an adviser. In the scenes, either a mistake had just been committed or a

difficult action was about to be taken elsewhere by the advisee, but it was the role of the adviser that was particularly scrutinized by the participating observers. His performance as an adviser was repeatedly evaluated and practiced over and over, with many variations in casting, role reversal, scene-structuring, and advisee response, as the shortcomings in performance were pursued through discussions alternating with scenes. Success was reckoned as beginning to occur when the participants could report back to the groups that in real life outside the group they found their behavior changing as they incorporated in their habits for dealing with such situations a sense of what a good adviser would advise, prior to taking action.

In retraining children who exhibit dangerous patterns of risk-taking in dealing with known hazards in the environment, those who have never had a good adviser in the person of a careful and caring parent with whom to identify may possibly show measurable improvement as they are provided experience with appropriate models with whom they can identify. To the extent that safety education is ever to include small children other than indirectly through their

parents and other adults, it seems likely that only a playlike form of education would be suitable.

But is judgment the only component of competence that even the safety educator would want to cultivate? Is not venturesomeness of equal or greater value? Are not many human beings handicapped by too great an emphasis on avoidance of risk? On the other hand, is there necessarily a conflict between judgment and venturesomeness? Perhaps the highest degree of self-care lies in reconciling these, as suggested by the popular notion of calculated risk. Beyond the methodological and theoretical questions propounded by social scientists about the taking of risks with known and unknown hazards lie philosophical questions, judgment on which belongs ultimately with the individual. Even girls who long for the dangerous pursuits of boys can achieve them by sacrificing other social values, and who but they are to decide whether this be wisdom or folly? There may also be religious considerations beyond the philosophical, as in differentiating between accidents and disasters, which truly befall without human intervention and may embrace not single individuals but vast numbers simultaneously.

Foote's discussion illustrates well the many fresh possibilities for accident research that open up when accidents are approached from a sociological point of view. Whether these will prove as profitable as now seems likely is, however, uncertain; the important point is that the skills and understanding that have been applied so productively to other social phenomena now need to be applied to accidents.

THE THEORY OF THE SOCIAL THRESHOLD

—T. T. Paterson

Accident proneness has usually been advanced as a psychological concept to describe the personality structure of certain individuals who have accidents repeatedly (see Chap. 7). In the next paper, the causative factors in accidents are divided into three groups: intrinsic (individual), extrinsic (social), and natural. The hypothesis is then advanced that accident proneness may be related to the social environment—*i.e.*, certain individuals become accident prone only under propitious social conditions. Thus we may conceive of an accident-inducing social situation as well as a psychologically accident-prone personality. In certain circumstances, social stresses may

produce emotional changes in the individual that interfere with his ability to act in a safe manner.

According to Paterson, a social threshold exists beyond which the individual becomes temporarily accident liable. These thresholds are established by the social group in terms of accepted patterns of safe and unsafe behavior. Repeated accidents may thus be a symptom of individual deviation from a group norm of safe behavior. This approach to accident behavior, although highly theoretical and poorly documented, demonstrates how social concepts may be employed in attempts to explain some accident phenomena.

* * *

THE EMOTIONAL FACTOR IN ACCIDENT CAUSATION

A definition used by Chambers is useful. "Accident proneness is the sum of personal qualities and activities which render a person unable to make the requisite and adequate responses in a moment of danger." A minority of such persons within a plurel will tend to have more accidents than would be expected from a chance distribution, that is, are highly accident prone.

Farmer, in a criticism of the researches of Lahy and Korngold, suggests that there is an emotional factor involved in accident causation, and that this factor is the main one. Sensori-motor tests, as Chambers' own figures show, do not help us to estimate the conditions leading to accidents, though, of course, they assist in reducing the probability of accidents, whatever these conditions. Eliminating those drivers who show proneness under test, there remains over 90 per cent. of accidents to the drivers as a whole, attributable to conditions under which accident proneness is of a form for which, as yet, there is no testing technique. Obviously a certain proportion are accidents which cannot be avoided, such as those resulting from mechanical defects.

... for large-scale accident reduction we must examine the situation not only in terms of the proneness of the individual but of the conditions wherein the proneness can express itself. ... we may infer that the

total personality of the individual concerned is relevant to proneness; and this specific personality expresses itself in a variety of ways according to the configuration of the social and material environment of the moment. For example, a woman operator in a factory may not show accident proneness under test, but in certain social conditions she will wear high-heeled shoes to work and become accident prone. We cannot measure this tendency to indulge in behaviour contrary to the group mores relating to accident prevention (though experiments are proceeding in this direction), but we can evaluate the total social situation in which she will tend to wear high-heeled shoes.

Factors contributory to accident causation of all kinds may be divided broadly into three groups.

(a) *Individual*: Intrinsic, physiological characteristics which can be estimated by sensori-motor tests. Specific aptitudes such as eye-hand co-ordination, speed and distance judgment, reaction times, visual acuity, etc., and even, to some extent, individual tendency to pre-occupation, and liability to distraction.

(b) *Social*: Extrinsic factors which involve social interaction in its unrestricted sense, that is, the relationship of the individual to his society, and his orientation within the cultural pattern of that society: e.g., driving accidents involving another person (pedestrians, cyclists, children), lack of courtesy on the road, thoughtlessness and selfishness (i.e., non-conformation to folkways), dis-

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obeying of the Rules of the Road and Flying (i.e., non-conformation to established patterns, the mores), instability, pre-occupation and liability to distraction due to immediate social factors, etc. Age and sex correlations, according to figures available, appear to be associated with social factors.

(c) *Natural*: Weather conditions, for example; mechanical, involving breakdown of machinery; and factors beyond the control of man to a very great extent.

Most approaches to the reduction of accident rates involve testing for the individual factors, and efforts have been made to avoid or reduce the factors of the third, 'natural' group. The second group has on the whole been recognised, and action taken, as for instance in the issue of the "Rule of the Road," "Flying Instructions" and the use of propaganda, or, especially in factories, by the enforcement of rules. But whereas the test method has been developed along rational scientific lines, and natural hazards have demanded a scientific approach, the social factors have been controlled by methods which could only be called empirical, and sometimes even irrational. It is this group of factors which is the most prominent in driving and flying, and in industrial accidents (in about 80 per cent. of cases, according to the 1947 REPORT of the Inspector of Accidents in Factories).

The social character of most driving accidents requires no clarification, but it may be asked whether the accident to the single-seater aircraft pilot is social. A quotation from a report of the Flying Safety Division of the U.S.A.A.F. may clarify this:

Emotional maladjustments that result from social and occupational stresses imposed upon ordinarily well-balanced personalities frequently affect behaviour and performance. Unsolved personal problems lead to variations in mood, efficiency, and ability to concentrate. The personal factors which predispose to poor performance are usually not apparent to a pilot who has just been involved in an accident: even if he recognises their importance, he is loath to admit them as causal factors since that would be an admission of "pilot error."

The most frequent sources of emotional maladjustments are unsatisfactory social relationship with wife, family, girl friend and colleagues; financial problems, unsatisfactory living condi-

tions, boredom, instability resulting from frequent changes of location and resentment towards, or lack of confidence in, officers in command, or fellow officers. Furthermore, there may be the external pressure exerted by wife or relatives or the internal pressure of fear directed toward ceasing the relatively hazardous occupation of flying.

In a squadron in our own Fleet Air Arm during the war, four out of fifteen pilots had been married for periods of two months or less. Within a very short space of time two had been killed, one doing what he had performed probably hundreds of times previously, a third had a nearly fatal accident and the fourth was taken off flying "for a rest." There is no way of telling, but the chances of accident to those men seem to have risen on marriage. Certainly there appear to be grounds for this assumption, shown in the attitude of F.A.A. navigators generally, in their dislike of flying with newly married pilots.

These general observations lead to interpretation of the accident situation in terms implying a dynamic characteristic. Accident proneness is constantly altering as the environment alters. Thus the emotional aspect of accidents, in the definition of accident-proneness propounded by Farmer and developed by Davis—disorganisation of skilled activity under emotional and other conditioning—may be clarified in the following manner, following Chambers. The sum total of general qualities and activities which render a person unable to make the requisite and adequate responses to a position of danger, i.e., liable to sustain accident, may be altered from moment to moment under the stresses of changing social environment. In precipitating social conditions, individuals with poorer sensori-motor co-ordination will become more quickly prone to accident since their skilled capacities and activities are nearer a state of disorganisation. In non-precipitating social conditions, they will not necessarily sustain accidents at a rate higher than that normally probable for natural hazards. This implies that social stresses give rise to emotional changes which in turn disorganise skilled activity.

There is a wide range of interdependence between individual and social factors in accident proneness. For instance, the individual factor can be completely inhibited by social conditioning, e.g., a car driver with poor eye-hand co-ordination would probably avoid accident by punctiliously obeying the Rule of the Road, i.e., conforming with the mores. Or the social factors tending towards accidents may be strong and the individual factors weak: for example, a racing driver may at times disobey the Rule of the Road. This is a common situation among fighter pilots under certain conditions, as when a first-rate pilot, having "made a kill," will express his exuberance by carrying out slow rolls over the aerodrome, and by finishing up with a spectacularly unorthodox landing. Here the unpredictable situation liberates a traditional reaction which overrides a behaviour norm for non-combat flying. The greatest possibility of accidents arises where there is poorest individual sensori-motor co-ordination and weak social conditioning.

THEORY OF SOCIAL CONDITIONING

During 1941 the general situation with regard to flying accidents was examined by Dr. Kenneth Craik and myself in a discussion of the value of the Cambridge Cockpit which he had then built. He pointed out the limitations of his instrument and, indeed, of any known methods of psychological testing for accident proneness amongst pilots; and we did not have the assistance of the figures quoted above. He brought to my notice Farmer's ideas on the emotional factor, and we agreed on the value of the possibilities of an anthropological approach to the situation.

The general theory of social structure upon which the practical approach is founded cannot be given fully here. For lack of an appropriate word I borrow a term from gestalt psychology, using 'gestalt' as roughly equivalent to a field of orientation or configuration within the life space of the individual; and I apply the same term to the fields of orientation of the society. The

'gestalten' of the individual reflect those of the society, and the unity of the individual gestalten will depend upon the unity of those of the society. Deviation from the norm of social behaviour is either the result of lack of such unity, or is intrinsic. Therefore, if the unity of social 'gestalten' is improved, it is most likely that deviation from the social norm will be decreased, and hence reduction in the numbers of the accident prone, since proneness, regarded from the broadest point of view, is a deviation from the social norm.

For purposes of discussion the problem may be approached more easily diagrammatically. In Fig. 1 let the vertical co-ordinate represent the population in numbers, and the horizontal the strength of group conditioning, decreasing away from the origin. Theoretically the situation in an ideally integrated community, in which the social 'gestalten' are unified, is represented by curve A where the norm of behaviour, the maximum of distribution of behaviour pattern, is coincident with maximum conditioning, i.e., the majority of individuals conform to the mores and folkways completely. The tailing off, here shown as ideally asymptotic, represents the incidence of intrinsic deviation, the actual form of the curve depending upon the type of society and other factors promoting idiosyncratic development. Allport's J-curve distribution patterns are positive indications of the validity of this form of curve.

At progressively lowered states of group conditioning, the greater will be the number of individuals who fail to conform to the pattern of prescribed safety behaviour, and the greater the possibility of accident. The

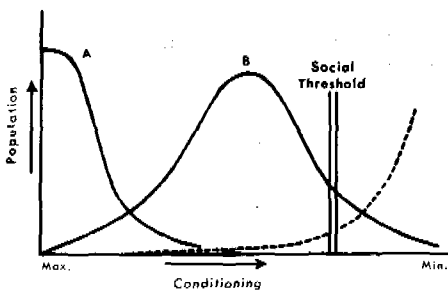


FIG. 1.

vast majority of accidents have a social component, and the possibility of accident is increased if two poorly conditioned individuals are involved in any one situation. Beyond a certain level of conditioning, in such a situation of interaction, this possibility becomes a probability, the chances are much increased, and the curve of accident possibility (interrupted line) rises steeply. As a simple instance, if one poorly conditioned driver who believes in holding to the crown of the road, meets another, better conditioned, driver who keeps to the proper side, there is some possibility of accident, but the chances are small. Whereas if the first driver meets another as poorly conditioned as himself, either in keeping to the crown of the road or in driving too fast for the width of the road, the chances of accident are enormously increased. This limiting level of conditioning I propose to call the "*social threshold*." I wish to make it clear that this threshold cannot, in the present stage of the development of anthropological technique, be expressed in any terms of concrete values, nor need be for the purpose of my argument.

Few societies, except some primitives such as the Eskimo and the Australian, approach the ideal of integration. Indeed, the more civilised a society the less integrated it becomes and therefore the greater opportunity for expression of idiosyncrasy—the so-called "*freedom of the individual*" in modern political jargon—whence arises the greater need for institutions to compel or to persuade conformity to the contemporary ideal of social pattern. Thus in a modern community, at some given moment, the situation with regard to a particular social '*gestalt*,' say in motor driving, can be expressed in the curve B (ideally asymptotic for this discussion), the maximum being at that level of conditioning, N, called the *norm of behaviour*. Those individuals who depart widely from the norm are regarded as deviants, even though there may be some among them who conform more rigidly than the majority to the ideal of the pattern. Such individuals, who stick most rigidly to the

rules of the road, may be regarded by the group as obsessional. On the other side of the norm we find those labelled "*road hogs*" and "*dangerous drivers*."

Among the Eskimo there is a very high, fatal, accident rate for men due to natural hazards which lead to starvation, freezing and drowning. Deviation from the norm of behaviour will increase that rate, for the norm has been set up through a tradition of practice in avoiding these natural dangers. The norm of behaviour guarantees a better chance of life, not only for the individual but for the community; therefore conformation is essential. The member of a community who does not conform, the deviant, is ejected as a danger to the community, constituting elimination of the accident prone. The slightest change from the traditional norm in such circumstances sets up a deep fear complex, offset by such devices as the wearing of amulets.

In our society, where deviation from the social norm will not necessarily lead to death, or serious injury, or harm to the community, we still indulge in similar ideas. We hesitate to walk under a ladder because it is unlucky, though we try to rationalize in terms of the immediate concrete, say about a paint pot at the top. To go under the ladder is a deviation from a traditional norm of behaviour which bars such actions as dangerous. The origin of the tradition is lost, but the behaviour remains, unrelated to a conception of evil spirits or some malign influence, but merely a demand of society to conform. The breakdown of such traditions in modern societies is not the result of a decay of superstitious fear, but an aspect of the gradual widening of opportunity for expression of individual idiosyncrasy.

The diagram shown by Fig. 2 may be taken to illustrate, crudely, the relationship between norms of behaviour and of attitude. The attitude of the group may be overtly expressed in terms more closely approximating the idealisation of the social values of the group, say of the form of curve D, with a norm of attitude N_1 . Thus in any group at any one moment the expression of

attitude about driving may (a) nearly conform to the Rule of the Road in the light of social evaluation of life, the rights of others, etc., and (b) deviate from the ideal in the expression of belief that in certain circumstances the Rule need not be rigidly followed. "One doesn't really need to stop at every Halt Sign when one knows there isn't any traffic on the main road at that time," or, as a rationalization, "If we stopped at every Halt Sign and drove always at 30 or below, we'd never get anywhere." The actual behaviour distribution (c) lies even further from the valuational ideal.

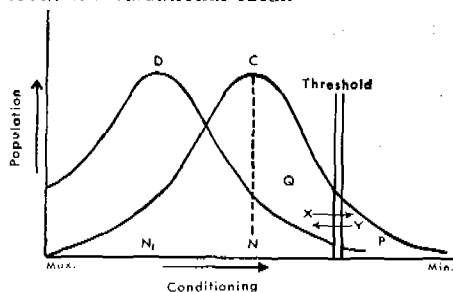


FIG. 2.

The social threshold of accident possibility at any given moment, may bear a relationship to the curve of behaviour C, as shown in Fig. 2. That is to say that beyond this threshold those individuals within area P are deviants from the norm N, so much so that they are more frequently exposed to possible accident, especially if the other half of the social interaction involved is a similar deviant, whereas an individual within the area Q, being more strongly conditioned, will conform more closely to the Rules of the Road and will much less often be exposed to situations of danger.

But the situation is not static, since the social situation, *vis-à-vis* the individual, is in a constant state of flux, and from moment to moment, therefore, the conditioning of individuals within their respective regions is altering. Thus individual X, in region Q, may be translated into region P, for example, through being distracted by conversation in his car (his companion deviates by distracting the driver); and an individual Y in

region P, who, for instance, has been driving tempestuously owing to a breakfast quarrel with his wife, may calm down and conform to the norm of behaviour, thus moving into Q. These are immediate and internal social factors.

* * *

THE DYNAMIC CHARACTER OF ACCIDENT POTENTIALITY

An internal social factor has been mentioned. External, non-individual groups of factors, (b) social and (c) natural, may also show variability. (b) The total socio-economic situation of the group may change: either new values may come into being, or the attitudinal pattern alter, and thence the norm of behaviour. War, for example, may introduce a new evaluation of the rights of the individual, or of life. The economic situation may become such that the number of vehicles on the road alters, and with that the behaviour pattern.

(c) The non-social condition may change, for example, the weather, or mechanical devices; and the reaction to such changes will be (i) an intrinsic individual response on a physical plane, as when very hot or cold weather reduces the efficiency of the individual faculties; (ii) the inapplicability of the existing state of conditioning to a new and unpredictable situation, bringing in an element of doubt, of the nature of '*anticipatory tension*' as Davis calls it; for example, when a new form of gear change is introduced.

These factors, and more especially the constant change of internal social forces acting upon the individual, give the total social system its essentially dynamic character. It is this character which may explain the mechanism of regression towards the average. A specific group of accident potential operators may be found within the field P at any one moment, that is they have then a given proneness to accident, but during a succeeding period of time they may drift into field Q, and the proneness decrease. But over the total of periods that group of accident potential operators retains its status of potentiality relative to the non-potential.

That is, the *predictability of accident* on the basis of performance history or accident liability (but not in terms of proneness), is *small*. Therefore, except in so far as it involves drivers who are also prone to accident, the removal of "repeaters" will not be any guarantee of reduction of accidents since the majority of such drivers would, in the future, drift into region Q, and a new

group would drift from region Q into P. Theoretically, however, if the process were repeated over a sufficiently long time, elimination of possible migrants into region P might be obtained; in other words, elimination of accident potential individuals. Because of the length of this period, the method of elimination based on accident history would be unworkable.

Paterson makes the important observation that a society sets up social norms to protect its members from accidents and that some accidents may represent a deviation from these norms. (It is also probable, however, that some social norms favor the occurrence of accidents.) This approach brings accidents directly within the scope of sociological analysis. From this point of view we can see that to the extent to which accidents result from deviant behavior they may be studied as evidence of social pathology. It would not be too difficult, from this starting point, to construct a sociology of accidents, utilizing such concepts as roles, norms, reference groups, and group pressures.

It should first be scientifically demonstrated, however, and without circular reasoning, that some accidents do indeed represent deviant behavior, and this Paterson fails to do. Accidents of this type might include, for example, those resulting from disobeying a traffic signal or wearing high-heeled shoes to work in a factory. Such accidents may reflect inappropriate behavior that increases the individual's susceptibility to danger. They may constitute an interesting class of "social" accidents, one that has not received much attention in the literature.

- Paterson's speculations leave much to be desired from a theoretical point of view.
- ✓ First, his assumption that social conditioning is always aimed at decreasing the possibility of an accident is unreasonable. There are probably many social acts, such as drinking and speeding, in which conformity to the social norms may increase the likelihood of accident. Secondly, the concept of a social threshold or cutting point on a normal curve of behavior seems unlikely to prove either valid or useful. It would probably be difficult if not impossible to identify or locate this supposed threshold for any individual or group, if it exists. Further, it is doubtful that such a threshold would be of an all-or-none type, with individuals being safe up to the threshold and unsafe beyond it. Thirdly, Paterson's use of such terms as mores, norms, and deviance is extremely loose, and the concepts are inadequately defined. Mores and folkways are used interchangeably, and nonconformity is often confused with disobedience. We have learned from research on juvenile gangs that what appears to be an absence of conformity may really be rigid conformity to one's own subcultural group norms. This distinction raises the interesting possibility that different subgroups of our society have different types of accident liabilities because of their differing definitions of hazardous situations and their varying norms of safe behavior or risk-taking.

YOUTH AND THE AUTOMOBILE

—Ross A. McFarland, Ph.D., Roland C. Moore, Ph.D.

Today the automobile, one of man's own inventions, provides a greater threat to his health and well-being than many diseases. The lethality of this vehicle can be traced, in large part, to the social and psychological factors that determine its use. The emphasis on speed and appearance, as opposed to safety, the status needs it serves for the driver, the opportunities it provides for the release of hostility and aggression, all combine to make the automobile a major mechanism for the production of injury.

These points are clearly documented by McFarland and Moore in their excellent appraisal, *Youth and the Automobile*. As these authors point out, youthful drivers have a disproportionately higher accident rate than adults. Explanations offered for this fact include their relatively shorter driving experience, their less developed sense of responsibility, immaturity, and negative attitudes toward safety. The experience factor seems to be particularly important in view of the evidence that driver training for young people appears to be to some extent effective in reducing traffic accidents, although much better controls are needed on the self-selection factor of those subjects who volunteer for such training before we can be certain of this. (Such self-selection has been well documented.⁸) There is some evidence that personal adjustment is also important, the less well-adjusted youth having the higher frequency of accidents.

In an interesting analysis of the behavioral and cultural implications of these findings, the authors analyze such phenomena as the "hot-rod" and discuss some of the social and psychological needs served by the automobile. The automobile is a symbol of economic and social worth; it provides a vicarious sense of power; it represents freedom and escape from parental authority; in many areas it is an essential feature in dating and courtship. For many young people it provides an outlet for hostility, discourtesy, emotional conflict, and revolt. All of these factors may combine to make the automobile for some a weapon rather than a convenience, and unsafe, rather than safe, driving habits the more satisfying way to operate a car.

IT IS CERTAINLY OBVIOUS that the wide use of motor vehicles is one of the outstanding characteristics of modern life. In the United States, during the past fifty years, the automobile has developed from a rare and expensive luxury to a common necessity. Today the family car is so essential to our way of life that it is included in cost-of-living indexes. A large proportion of job-holders depend on highway transportation, either by bus or private car, for getting to work. For

the movement of goods, trucks are a prime necessity. Our civilization is indeed based on the mobility provided by motor vehicles.

As one writer has said:

Most of us know, or suspect, how heavily our postwar prosperity rests on the twin supports of new cars and new suburbs; in fact, the latter depend primarily on the former. The leisure life of these suburbs is nonlivable without the car, and the two-car garage is spreading even in the "tract" houses of the mass-produced suburbs—freeing the wives for sociability, shopping, and chauffeuring of children. In this connection, one

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should think not only of the new suburbs ringing the old cities but also of those parts of the country, such as California, which may be regarded as suburban to the urban East. The car not only enhances the freedom of people to move west and southwest (and to Florida) but helps shape the image of the good life which these suburban states symbolize, a life in which at work or play one always has one's car beside one as a potential escape mechanism.

A few examples of the extent to which the use of automobiles and vehicular traffic have increased in modern times will help to delineate the magnitude of some of the problems that have accompanied this "progress." In 1958, automobiles, taxicabs, and trucks, operated by 82 million licensed drivers, traveled some 665 billion miles on the highways of the United States. Drivers and passengers in automobiles and taxicabs alone accounted for more than 1 million millions of passenger miles of travel in that year. About one-fifth of this total was accomplished on turnpikes and toll highways alone. To use another index, in 1950 there were approximately 40 million privately owned automobiles registered in the United States; today there are about 70 million; by 1970 this figure is expected to reach 90 million.

It is obvious that youths or young adults have both participated in and been influenced by the use of the automobile in the American culture. The attempt will be made in this paper to review the role of the automobile in the cultural and behavioral patterns of young persons. Especial attention will be given to the problems of safety and to attempts to solve these problems.

* * *

BEHAVIORAL AND CULTURAL IMPLICATIONS

The Automobile and the Emotional Needs and Cultural Patterns of Youth: Automobiles, besides providing transportation and mobility, often seem to serve additional individual needs or motivations of their owners or operators. As a symbol of economic and social worth, the automobile has long provided its manufacturers with a promotional approach based on the inner needs of prospective purchasers. A vicarious sense

of power in the operation of a motor vehicle has also been cited as an important satisfaction in the lives of many who are denied outlet for such yearnings in other areas of their lives.

The symbolic value of the automobile may be of particular importance for the adolescent and young adult. To many it is said to represent freedom and escape, both real and symbolic, from parental control and supervision. Moreover, the automobile has become an important factor in adolescent culture. For example, in many groups it is an accepted pattern that in order to date a girl, a boy must be able to provide a car for transportation; she may not go in a cab or allow herself and her date to be driven by parents. To many boys the car itself becomes a dominant motivating force. Having acquired a car for transportation, socialization, and dating, they become so involved in its care and upkeep that they have little time or interest remaining for activities of which the car is not the focus.

One psychiatrist has expressed the view that driving an automobile is one aspect of contemporary life which makes it possible for persons to express hostility, discourtesy, and emotional conflict without much fear of reprisal, and often with complete anonymity. In poor driving he sees a common factor of revolt, expressed in a variety of adjustments used by the young driver (as well as others) to relieve him of ordinary restraints and to deny authority. Thus, an aggressive person may show his revolt by such behavior as cutting in, stealing the right of way, or horn blasting. A youth who is oversensitive to the actions of others may react with "getting even" behavior, finding an excuse for racing and speeding or employing obstructionist tactics toward other drivers. Or to prove his maturity and his mastery of the situation, the uncertain and insecure youth may race around, stop with a screech, and overcompensate with show-off kinds of driving.

Other writers have pointed out that the youthful driver may often use the automobile to "act out" the tensions and latent

aggressions which arise from the increasing amount of social control which the teen-ager faces, not only in regard to driving but in many other areas of his life.

Thus, the desire for status, for escaping special situations, for isolation, for working off tensions, and the like all may affect the individual's behavior as a driver.

The Role of the Automobile among "Hot-rodgers": Perhaps the clearest analysis of the ends which the automobile may serve among youth has been made in regard to the so-called "hot-rodger." In one study, carried out by psychiatrists, the distinguishing features of 30 young "hot-rod" drivers were summarized as follows:

1. *Physical characteristics:* the majority are physically advanced and strong.

2. *Background:* their early history shows evidence of emotional deprivation with an ambivalent relationship to the mother. Most of the boys come from middle-class homes.

3. *Interests:* interest in automobiles develops at an early age. At 14 years of age they want to drive a car. They do not participate in competitive sports, and they dislike reading and literature. Their verbal ability is low compared to their mechanical ability.

4. *Personality dynamics:* they have aggressive temperaments which were probably manifested quite early in life. Rorschach responses and dream material indicate that they have oral-sadistic fantasies (a lion is going to eat me). There is also evidence of severe compulsive early training. They usually manifest two alternating moods: a mood of boredom and a mood of stimulation that is attained on wild rides. Neither of these moods, however, is extreme enough to be classified as either depression or hypomania.

5. *Perception of the automobile:* the cases reveal that the automobile can become part of the body image, with the ego expanding to include the car. This gives the driver a feeling of megalomaniacal power and invulnerability. The present increasing tendency to give the car a nonfeminine name is an indication of the expansion of body image.

6. *Accident experience:* these drivers tend to be involved in few accidents. Although a self-destruction element can be seen in their behavior, the vitality, urge to live, and skill of the drivers pull them through. The "near miss" is the important thrilling event.

Additional studies with larger groups might alter some of the foregoing generalizations.

Problems of School Adjustment, Social Adjustment, and Delinquency: Many educators have expressed concern over the competition which the automobile presents to an academic program, and hence to the school's basic purpose of education. The view is commonly held that, among boys especially, the desire to get a driver's license and to own a car is probably the most powerful anti-intellectual force that our schools meet.

One study, carried out in a California high school, offers some support to these views. In this study, those boys driving to school frequently were compared with those not driving to school in regard to several indexes of school adjustment. Although the findings are not considered as conclusively a function solely of the automobile, the suggestive items were as follows: (a) drop-out rate was about four times higher in the frequent-driving group than in the non-driving group; (b) absenteeism was approximately twice as great in the driving group; (c) grade-point average, on the average, was about one half letter grade higher for the nondrivers, and (d) fewer courses were failed by the nondrivers.

Factual information relating to the role of the automobile in the social adjustment of adolescents in other areas and in relation to delinquency is very scarce. Some examples of the opinions and thinking in this area are outlined below.

Various juvenile and adult courts, as well as enforcement officers, have pointed out that a large majority of those who are 15 to 18 years of age come to their attention either directly or indirectly as the result of the ownership or use of the motor vehicle. For example, offenses peculiar to the automobile, such as the stealing of gasoline to

keep the car on the road, are said to be very common.

One probation officer has stated, in relation to the social problems that arise out of adolescent driving:

For many, the "clubhouse on wheels" is a medium for holding a party, to get out from under the control of parents, for having dangerous "drag" races, conducting gang meetings, committing a crime, or assaulting a girl. The list of problems resulting from driving is a long one: loss of control and supervision by a parent, increased temptations in the area of morals and liquor, giving up of school to work in order to operate and maintain that idol, the car, hoodlunism and bumming, crime, pseudo-sophistication and materialistic attitudes, and a false sense of values.

ACCIDENTS AND MOTOR VEHICLE VIOLATIONS AMONG YOUTHFUL DRIVERS

Motor Vehicle Injury and Death among Youths: One of the most serious problems in regard to youth and the automobile is the disproportionately high loss of life and the great number of injuries from motor vehicle accidents. Of 38,702 motor vehicle deaths in 1957, nearly one-fourth (8,667) were persons between 15 and 24 years of age. In addition, approximately 27,000 members of this age group received permanent impairments of one kind or another, and approximately 300,000 received injuries which were temporarily disabling.

The traffic deaths in this age group are of especial importance because they cut short the most productive years of life. A clearer realization of the significance of traffic deaths than is possible from their mere enumeration may be gained from an estimate of the years of life lost by these individuals. On the basis of the life-expectancy figures of the National Office of Vital Statistics, it can be estimated that a total of approximately 1,440,000 "life years" were lost prematurely in fatal motor vehicle accidents during *only one year*. Deaths in the teen-age-young-adult group (ages 15-24) alone accounted for 500,000 of those "life years" lost, and if the victims younger than 15 are included, the total for persons under 25 years of age reaches 800,000 "life years."

Analysis of Accident Rates by Age of Driver: The evidence of the past few years indicates not only that youth suffers heavily in death and injury from motor vehicle accidents but also that youthful drivers, as a group, are more frequently involved in accidents and show higher accident rates than would be expected on the basis of their numbers in the driving population. The results of two recent studies, in Connecticut and Massachusetts, are shown in Fig. 1. These data indicate that the rates are highest for the youngest drivers, those of age 16, which in these two states is the minimum age for licensing. The rate decreases with succeeding years of age, rapidly at first, and then more slowly, so that at about age 25-30 the involvement rate becomes lower than would be expected if age were of no significance. Another analyst of the Connecticut data shows a similar curve in relation to age of driver when "found at fault" in accidents is the factor studied. There is also some evidence that in states in which the youngest operators may drive only under restrictions, the highest accident rates are reached at about 18 years.

The question whether there is a difference between youthful males and females in regard to motor vehicle accident rates is very difficult to answer because of differences in amounts and kinds of driving. Perhaps the most direct information comes from the Connecticut study mentioned earlier. This is summarized in Table III.

From this table, which is based only on the number of drivers without reference to how much they drive—i.e., exposure to the possibility of accidents—it is clear that female drivers—in Connecticut, at least—are far less frequently involved in accidents than males. The implications of such information are valuable to insurance companies for identifying high-risk groups and for criteria for adjusting premiums. As far as the question of the relative safety of driving by girls and boys or young women and young men is concerned, however, these figures are not very helpful because they do not take into

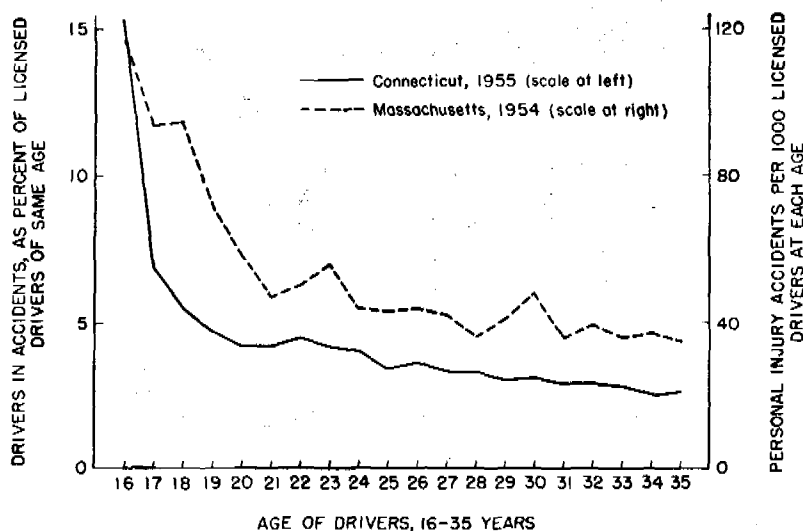


FIG. 1. Frequency of accidents among drivers aged 16 to 35, based on Connecticut and Massachusetts experiences.

account the fact that youthful males drive a great deal more than females. If boys and young men drive three times more than equal-aged members of the opposite sex, they acquire three times as much exposure to the possibility of accidents; on that basis, there would be very little difference, if any, between the safety records of the two sexes. Moreover, it is known that the peak of annual driving mileage occurs later for females, in the ages when they are driving to supermarkets and to bridge clubs and chauffeuring children. Accident rates for women are highest at these later ages.

The significance of the differences in violation records in the table between teen-age boy and girl drivers may be questioned, and there are not enough facts available for an answer. On the surface, the Connecticut data

suggest that girl drivers conform to safety and motor vehicle regulations to a considerably greater extent than do the boys. One should keep in mind, however, that driving by girls may be more closely supervised by parents than in the case of boys, that our culture tends to produce less nonconformity on the part of females, and that night driving in this age group is largely a male prerogative or duty.

Types of Driving Errors Leading to Accidents, by Age of Driver: Special research groups and state motor vehicle agencies have demonstrated relationships suggesting that a disproportionate number of teen-age drivers are involved in certain accident patterns. Statistics compiled by the Ohio Department of Highway Safety show that teen-agers were involved in 22 percent of all

TABLE III.—16-20-YEAR-OLD OPERATORS IN ACCIDENTS OR ARRESTED
CONNECTICUT, JULY 1955-JUNE 1956

Age	TOTAL LICENSED		PERCENT IN ACCIDENTS		PERCENT ARRESTED FOR MOTOR VEHICLE VIOLATIONS	
	Male	Female	Male	Female	Male	Female
16	2,306	853	38.2	17.5	31.1	4.0
17	8,716	3,832	14.1	5.2	28.9	2.5
18	12,106	6,239	10.1	3.4	24.1	2.5
19	12,133	6,925	9.4	3.3	23.8	2.1
20	12,575	7,486	9.2	2.9	21.8	2.4

night accidents, as against 17 percent of day accidents. They were involved in 25 percent of the accidents occurring between 6 P.M. and midnight.

Reports of the frequency of single-car accidents have indicated that these accidents are primarily problems of drivers below 25 years of age. The *Annual Statistical Report of the California Highway Patrol* for 1956, based on 150,000 drivers involved in approximately 88,000 accidents, demonstrated that for all ages combined, three out of four accidents involved other vehicles, with non-collisions, pedestrian, and fixed-object collisions following in that order. An analysis of the accidents of drivers younger than 25 years of age revealed that they had a disproportionately high frequency of single-car accidents. These included noncollision accidents, such as running off the roadway, overturning on the roadway, and fixed-object collisions.

Special single-car accident studies by the Wisconsin Motor Vehicle Department and Ohio State University have substantiated the California tabulations. The Wisconsin study revealed that fatal off-the-road single-car accidents among younger drivers were predominant over all other types of fatal accidents and were out of proportion to the number of drivers. Specifically, drivers under 20 years of age, although they comprised only 8.6 percent of the driving population, were involved in 28.6 percent of all the fatal off-the-roadway accidents and in 16.4 percent of all the other fatal accidents. Drivers from 21 to 25 years old also had a disproportionately high percentage of off-the-roadway accidents but of a slightly lower magnitude than the teen-age drivers.

A study of single-car accidents in Ohio in 1956 provided similar data. Furthermore, an analysis of the characteristics of drivers in these accidents indicates that the susceptibility of the younger ones may be due to inexperience. The study revealed that restrictive roadway features played a dominant role in off-the-roadway accidents for the 16- to 19-year-old drivers and for inexperienced drivers. Highway conditions, such

as poor pavement, narrow roadway widths, slippery pavements, and absence of center-line markings, were significantly related to the single-car accident experience of these drivers.

A study of personal-injury accidents in Great Britain for 1953 also supports the view that inexperience is the major factor in teen-age accidents. In this investigation the age of the driver was analyzed as a function of those errors considered to be primarily responsible for the accident. Errors which sharply differentiated the younger drivers from the others included "overtaking," "losing control," "swerving," "skidding," and "inexperience with type of vehicle in use at the time." Teen-age drivers were also responsible for significantly more accidents resulting from being "asleep" or "fatigued."

An analysis of the principal faults involved in California accidents in 1956, by age group, revealed that 61.9 percent of the teen-age drivers were considered at fault in the accidents. This percentage was the second highest for all the age groups and was exceeded only by drivers over 70. Speeding was considered to be the prime factor in the driver-at-fault accidents, accounting for 44.4 percent of the teen-age driver faults. The next important errors of teen-age drivers were failure to grant right of way, improper turning, and driving on the wrong side of the road. The accident involvement of teen-age drivers because of these latter faults, however, was lower than that of older drivers. Excessive speed has been demonstrated by the Vermont Motor Vehicle Department, as well as in Great Britain, as being the major characteristic of teen-age driving accidents.

Uncertainty of Data on Violations by Youthful Drivers: The data bearing on the frequency or severity of violations of the motor vehicle laws by youthful drivers are inconsistent. They do not permit any clear statements on whether youthful drivers are more or less likely to be arrested and reported for violations than are other drivers. The issues are confused by differences in atti-

tudes on the part of law-enforcement officers toward youthful and adult offenders, differences in reporting practices, and differences in the severity of penalties in various parts of the country, which produce variations in the deterrents to violation. An example of the difficulties to be encountered here is the interpretation of the findings of a study on the detection of speeders by radar. Of 419 arrests made on radar evidence during a four-month period, only 8, or 2 percent, involved drivers under 18. The two interpretations suggested are that the young drivers may be responsible for fewer speed violations than their elders or, as has been suggested, that young drivers may be more alert to the presence of police and may do their speeding when or where they are less likely to be apprehended.

There is some suggestion that among youthful offenders there is a group, comprising up to about one-third of all youthful offenders, who are repeatedly apprehended for violations.

ATTEMPTS TO INTERPRET THE HIGH ACCIDENT RATES OF YOUTHFUL DRIVERS

High Accident Rates at Time of Greatest Potential Skill: It is well known that the best scores on tests of physiological functions, sensory abilities, psychomotor coordination skills, and mental ability are made by young adults. Reaction times, for example, are shortest, night vision and glare resistance are best, and the ability to learn coordinated skills are highest in the late teens and early twenties. Thus, evidence that accident rates among young drivers are disproportionately high presents the paradox that the driver is most susceptible to accidents at the time of his greatest potential operating skill. Hence "youthfulness" rather than age per se has been cited as the important factor. The factors underlying this "youthfulness" have usually been interpreted as inexperience, various factors of immaturity, and attitudes particularly characteristic of youth.

The Factor of Inexperience: Since increasing age and increasing experience go

hand in hand, it is almost impossible to separate the experience factor from the other concurrent changes which may be occurring on the basis of age and hence to assess accurately the influence of inexperience on the safety record of young drivers. It is well known that in industry accidents are characteristically most frequent during the early phases of learning a new job or skill and decrease with increasing time on the job. It would be reasonable to assume that the same situation would prevail on the highway. Certainly, in the process of learning to drive, there are many accident-potential situations which are never encountered, and practice in handling such situations is not gained except during the course of acquiring further experience. One writer has pointed out that the judgment of traffic situations is perhaps the most important factor in whether or not an accident occurs and that developing this judgment depends on actual experience on the road. This writer has also commented that the young driver may often operate with insufficient margins of safety simply because his experience has not yet been sufficient to enable him to appreciate completely the speeds with which emergency situations develop and his own limitations in regard to the time relationships and physical forces involved.

The Role of Training: Closely allied to the factor of experience is that of training. Adequate training has been shown to be a very important method of keeping accidents low in many types of activity. In regard to highway safety, many studies have been made of the effectiveness of driver training. The results are in fairly good agreement that drivers who have taken formal driver training tend to have fewer accidents and violations than those who learned to drive in other ways. The results of a number of these studies are combined in Fig. 2.

Although it is clear that trained drivers initially have better records than the untrained, the studies made thus far do not conclusively indicate that the better record is solely the effect of the training. The studies do not eliminate the possibility that

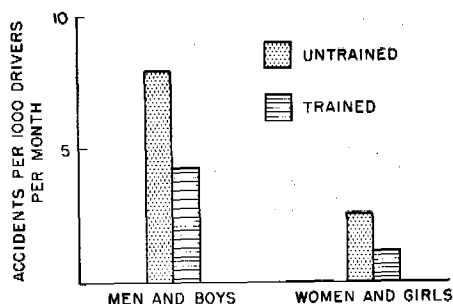


FIG. 2. The safety record of trained drivers compared with that of untrained, based on 1,226 accidents during an exposure of 300,536 driver-months.

those electing to take driver training may be those who would have better attitudes toward safety and be safer drivers in any event. Experimental evidence on this point has been entirely lacking until very recently. One study of teen-age drivers who were given psychological tests prior to their being old enough to learn to drive has indicated that those who later elected to take driver training were indeed different in several personality traits and adjustment tendencies from those who later rejected driver training and learned to drive in other ways.

The latter point does not imply that driver training has no beneficial effect. The control it can provide the driver and the development of attitudes favorable to safe driving are in themselves justification for the program. More research needs to be carried out, however, on the content and methods of driver training and on the possibility of including training in the recognition and handling of emergency situations.

Attitudes and the Control of Personal Adjustment: A wide variety of sensory, psychomotor, psychological, and physical characteristics have been investigated in relation to the accident rates of drivers and groups of drivers. Although highway accidents are usually attributed to human failure of some kind, close and invariable relationships between specific characteristics of drivers and the frequency of accidents have not been found. Some traits have been of importance

in some accidents but not in others. Thus far no single characteristic of drivers has been isolated which appears to account for a large proportion of accidents.

Those attributes of drivers bearing a gross statistical relationship to accident frequencies include low intelligence, youthfulness, and a personality make-up in which social responsibility is weak or lacking. As the evidence now stands, it appears that attributes most likely to show a sufficiently high relationship to the safety of driving to justify the application of preventive measures probably relate to personality and adjustment. Research emphasis in this area seems to be justified—especially toward the development of better methods of assessing temperamental qualities, attitudes, and personal reactions. There is great urgency for studies emphasizing this approach.

IMPLICATIONS FROM SYSTEMATIC STUDIES OF ACCIDENT-REPEATER DRIVERS

Concept that a Person "Drives as he Lives": Most of the studies that have been carried out on relationships between personal and emotional adjustments or attitudes and tendencies to have accidents have been concerned with adult drivers. One of these is described below, however, because it resulted in a concept which is very promising concerning the adult accident-repeater and which may also be useful in understanding the high accident rates among certain younger drivers.

In Canada, Tillmann has made an intensive psychiatric study of accident-repeater taxicab drivers and has noted the frequency of various kinds of personal and social maladjustments, as compared with the personal histories of taxicab drivers who were free from accidents. Of particular interest is the fact that the data include information on such items as school truancy and disciplinary incidents, juvenile court records, and disturbed family relationships.

On the basis of this analysis, the thesis was developed that "a man drives as he lives"—that is, if he makes mistakes in adjustment to the personal and social demands of living,

he will make repeated errors in his driving. Undoubtedly this concept applies to youths and young adults, and studies using this approach should be made.

The validity of this thesis was tested in an objective manner. The names of 96 accident-repeater drivers and two groups of 100 accident-free drivers, matched for driving experience and geographic region, were checked for a record of contact with a variety of judicial and public-service agencies—juvenile and adult courts (non-motor-vehicle charges), credit and collection agencies, venereal-disease and public-health clinics, and social-service agencies. The results are shown in Fig. 3. Sixty-six percent of the repeaters were known to one or more of these agencies, as against only 9 percent of the accident-free drivers.

Analysis of Off-duty Accidents among Young Military Personnel: Two recent studies are of interest because, being concerned with military personnel, they have included large numbers in the early adult age range. The first was an analysis of the off-duty private motor vehicle accidents at a large

military base. Several interesting findings came from this investigation. It was shown, contrary to the widely held opinion, that the off-duty accident did not primarily involve servicemen driving long distances on weekend passes. It occurred predominantly during evening hours of freedom and in connection with short trips near the base in quest of recreation and entertainment. The analysis also indicated that the personnel chiefly involved in the off-duty accidents were the young, low-ranking, unmarried servicemen living on base.

The second study was an interesting psychological, physiological, and psychiatric study of airmen, comparing those who had had motor vehicle accidents with their accident-free counterparts. It was found that of all the comparisons made, the one area in which differences were consistently found between those having accidents and those who were free of accidents was that of personal values. Accident drivers ranked consistently lower on scales measuring religious values and higher on scales of aesthetic and theoretical values. When this test was applied to other groups of airmen, the accident drivers could be identified with an accuracy of 75 percent on this basis.

A Long-range Psychological Study of Teen-age Drivers: The study described above is now being extended to a long-range investigation of teen-age drivers. The test of personal values referred to above, along with several other tests of personal adjustment and attitudes, were given to all the male sophomores in the high schools in and near Denver prior to the time they were old enough to obtain a license. These students are being followed with respect to accidents and violations for a period of at least three years. Their test scores and other data from school administrative records will then be analyzed in reference to the driving history to determine whether, on the basis of personal and attitudinal variables, those likely to have accidents may be identified ahead of time so that preventive measures might be applied.

One of the interesting preliminary find-

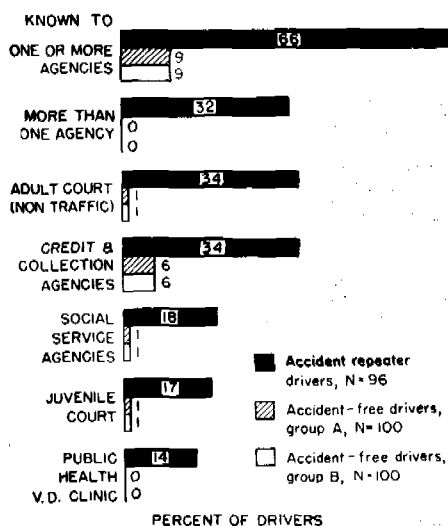


FIG. 3. Personal and social adjustments of accident repeaters and accident-free drivers matched for geographic location and driving experience.

ings in this study is that already, with an average driving experience of about 17 months, 16 percent of those identified as likely to have accidents have sustained one or more major accidents for which they were responsible. Four percent have incurred two or more hazardous-driving citations, and 7 percent have already had license suspensions as habitual violators.

A Study of the Attitudes of Teen-age Accident Repeaters: It is only in recent years that systematic studies on accident repeating have been specifically directed toward the teen-age driver. Some of these are not yet completed, and the results are not yet available. One study which has been reported involved two groups of students from various high schools in Pennsylvania. The drivers in the first group had had two or more traffic accidents. Those in the second group were chosen to match the individuals in the first group with respect to geographic location and length of driving experience but had had no accidents. Both groups were given a standard psychological test of emotional and personal adjustment and a Driver Attitude Inventory. The investigator found that the youthful drivers having accidents tended to score high and those free of accidents tended to score low with regard to each or a combination of several attitudes, as follows:

1. An attitude toward driving as activity which relieves psychic tension.
2. An attitude toward driving as a form of behavior by which youthfulness may be compensated for and the role of an adult may be assumed.
3. An attitude toward driving as a form of behavior in which confidence in one's ability may be manifested.
4. An attitude toward driving which does not consider speed as an element of danger or, if it is considered dangerous, an attitude manifesting desire for danger.
5. An attitude toward driving which places greater emphasis on the power of a vehicle than on its style or utility. On the

personality tests it was found that the accident youths showed more disregard of social morals, more defiance of authority, and more of a tendency to excessive activity and enthusiasm.

On the basis of items in the various scales of this test, the investigator concluded that persons who had had the following experiences are more likely to manifest behaviors which result in accidents:

1. A desire to leave home.
2. An urge to do something harmful or shocking.
3. A tendency to be influenced by people about them.
4. Association with peers to whom parents object.
5. A desire to frighten other individuals for the fun of it.
6. A tendency to become readily impatient with people.
7. A tendency to be somewhat suspicious of overfriendly people.
8. A possibility of having been in trouble with the law.

A Survey of Teen-age Problem Drivers: A Michigan study involved the analysis of the case histories of 100 teen-age drivers deemed the "poorest drivers" by their driver-education teacher. Unfortunately, since no comparisons were made with "good" or "best" drivers in this investigation, the interpretation of the results is limited. The investigator observed that four-fifths of these "poorest drivers" were working below their level of ability in school, two-thirds were discipline problems in school, three-fourths had poor relationships with their teachers, and half were considered aggressive. Information collected on the family relationships of these students and on their driving habits indicated a large amount of family disruption in this group and driving habits that were characterized by show-off behavior, recklessness, and habitual speeding. He concluded that these problem drivers either do not learn rapidly enough to accept respon-

sibility or have strong antisocial urges and unstable personalities and thus accept little or no responsibility. He suggests that maladjustment may be expressed in driving habits: an extreme need for recognition may lead to reckless driving, feelings of escape may manifest themselves in excessive speeds, and active hostilities toward control may be expressed through rejection of the responsibilities involved in driving and disregard for the social controls of traffic rules and regulations.

EFFORTS TO IMPROVE THE DRIVING AND SAFETY OF YOUTHFUL DRIVERS

The Influence of Corrective and Preventive Measures: Various programs and procedures have been developed in attempts to reduce accidents and increase safety on the highway. Those that are of particular relevance to the improvement of driving and of safety among teen-agers and young adults can be roughly grouped as follows: (1) safety education and driver-training programs, (2) youth safety conferences and driving clubs, (3) driver clinics and retraining schools for violators and accident drivers, court actions, and penalties, and (4) administrative policies of motor vehicle departments centering about control over the license privilege.

The influence of programs of driver-training on accident frequencies and on violations has already been discussed. It is apparent that much research remains to be done on the improvement of driver training, in reference to both the content and the method of such programs. It appears that classroom training plus supervised behind-the-wheel practice is more effective than classroom training alone with practice unsupervised.

The possible role of synthetic trainers and simulators is now being explored. It seems likely that if training in more aspects of traffic situations can be provided through such aids, the results would be reflected in improved driving on the highway. Driving practices to prevent or control skids, for

example, or to take evasive action in rapidly developing emergency situations could be developed more systematically than at present.

Apart from the many studies on the influence of driver training on safety and violation rates, there have been very few adequately designed investigations to test the influence of preventive and corrective measures. As has been pointed out by various writers, the effects of safety campaigns and propaganda and of various court and administrative practices are largely unknown, in regard not only to younger drivers but also to their elders. Some statistics have been presented which suggest an improved performance on the part of those violators and accident drivers who have attended driver clinics and retraining schools. Most of these studies, however, embody technical weaknesses which render the findings inconclusive. There is also very little evidence available on the relative effectiveness of various actions taken by judicial or administrative authorities.

One suggestive study (which included both young and adult violators) analyzed the accident records prior and subsequent to the re-examination of some 4000 drivers who were interviewed on the basis of their poor driving records. The conclusion was reached that in general, when pre-examination records were not heavily weighted by the more serious offenses, educative and persuasive procedures were more effective than more drastic actions. If pre-examination records were extremely poor, no type of action seemed to be more effective than any other.

One study (which for obvious purposes should not be identified while in progress) is currently being carried out on a group of several thousand teen-age drivers. The purpose is to test specifically the influence of various procedures on subsequent driving habits and accident and violation experiences. Some of the procedures being compared are: (1) participation in special group discussions designed to clarify and

improve attitudes, (2) attendance at standard traffic-violator schools and driver clinics, (3) fines, probation, and other court actions, and (4) administrative actions regarding the holding of the license.

Current Proposals for Improving Safety and the Quality of Driving: Several procedures being tested or proposed for the improvement of youthful driving and safety emphasize (1) the extension of driver training to all youth of high school age, (2) the improvement of driver training, and (3) a greater emphasis on rehabilitation and educational procedures in the disposition of cases made by courts and administrative agencies.

It has been proposed that driver education must not be restricted to imparting knowledge on good driving techniques and traffic laws and to developing the physical skills required in the operation of the car. Developing attitudes which will ensure safe driving will require special instruction beyond stressing the importance of attitudes. Procedures should be developed to help young drivers to understand their attitudes toward driving in a therapeutic sense and to aid them in solving personal problems.

The importance of having young persons themselves participate in efforts for the improvement of safety in driving habits has also been recognized. Several Youth Highway Safety Conferences have been held on a statewide basis under the sponsorship of state and civic organizations. No systematic evaluations of the effectiveness of these conferences have as yet been made.

Mention should also be made of those driving clubs and "hot-rod" organizations sponsored by civic groups or individuals. Such activities are believed by many to constitute an important factor in eliminating hazardous driving from the highway.

Several recent proposals are focused on control over the license privilege as a means of enforcing good driving and safety. Many administrators believe that the threat of the loss of one's license is a greater deterrent than are fines or other penalties. In most

states the motor vehicle administrator has discretionary power to suspend the license, and the current trend seems to be toward an increase in the exercise of this power in regard to the teen-age group. In this connection, some states are now considering the first license to be a probationary one, to be held and replaced by a permanent license only through the demonstration, on the part of the licensee, of a satisfactory driving record.

At present there is an active controversy on whether improvement can be achieved through raising the minimum age for licensing. Current opinion seems to be that requiring a minimum age of more than 16 years may well introduce more difficulties than would be solved. Perhaps the most serious drawback to a minimum age of 18 would be that the high-school driver-training programs would then be available only to a few students, who are older than the average.

SUMMARY

In this presentation an attempt has been made to indicate the role of the automobile in American culture, with particular reference to adolescents and young adults. It was shown that the vast majority of young persons in the United States have become drivers during their late teen years. The influence of the automobile on the behavioral and cultural patterns of youth was reviewed.

Problem areas, in regard to the use of the automobile, included school adjustment, social adjustment, and delinquency. The question of safety was shown to be of great significance in youthful drivers. The data on automobile accidents showed a high incidence of injuries and deaths in the younger age ranges. Youthful drivers as a group were also shown to have disproportionately high accident rates. The high accident rates in youth have usually been attributed to inexperience and lack of training, but in recent years there has been growing evidence of the influence of attitudes and personal adjustment on one's behavior in driving.

Several studies of adult and youthful accident-repeater drivers were reviewed for their implications regarding the improvement of the safety record and especially the quality of driving by the teen-age group. It was also pointed out that there is very little information available on the effectiveness of the var-

ious measures employed in an attempt to improve safety. The need for research to supply factual information was stressed throughout. Such factual information is required for the design of effective educative, corrective, and rehabilitative measures in regard to the use of the automobile by youth.

Although the data on the comparative accident frequency of youth and adults are apt to be unreliable because of biased reporting, and in particular because of the probable tendency of police and others to presume that youths in accidents are responsible for their occurrence, there can be no doubt about the importance of automobile accidents as a cause of injury and death to young people. The various studies cited in the foregoing article provide impressive evidence concerning the need to change the attitudes and behavior of young men and women in regard to automobile driving. These studies range from large-scale sampling surveys to psychological comparisons of accident-free and accident-repeating groups and detailed clinical studies of "accident-prone" drivers. However, many of these studies are subject to serious criticism on grounds of sampling and the control of extraneous factors. The studies most relevant to the present chapter are those that attempt to analyze the ways in which the social meaning and utilization of the automobile increase its accident-generating potential. Similar studies are needed on the meaning of automobile driving for adults and, for that matter, the meaning of other potentially dangerous devices, such as firearms and pleasure boats.

The evidence presented in the foregoing article on the misuse of the automobile by many youthful drivers is compelling. The analysis of this problem from a social and cultural point of view highlights the important role that values and social norms play in determining accident behavior. The authors' conclusion that "a person drives as he lives" (*cf.* Tillmann and Hobbs in Chap. 7 and McFarland in Chap. 2) indicates the importance of understanding accident behavior not only in terms of the immediate accident situation but also in terms of the social and psychological factors that influence the individual's behavior in general.

DRIVING ATTITUDES

—Harry W. Case, Roger G. Stewart

One of the major areas of potential social-psychological contribution to accident prevention is the study of driver attitudes. Regardless of the definition one chooses, attitudes, as indicative of an individual predisposition to act in a certain manner, are important factors in determining driver behavior. We know very little today about either the attitudes or the behavior of drivers in normal traffic situations, let alone those in which accidents occur. Attempts to relate general attitude scales to driver behavior have not proved productive. Similarly, safety programs directed at the general public and stressing attitude changes have not been scientifically shown to

produce any substantial reduction in accidents, and the burden of proof of positive results lies on program planners and administrators. These negative results, however, do not, for the most part, represent carefully designed and well-conducted studies. Much more painstaking work is needed in this area.

The present article brings together the results of the few studies that had been done in this field by 1956. It discusses various definitions of attitudes and the possible relationships of these attitudes to driver behavior. The use of two scales—the Conover Driver Attitude Inventory and the Siebrecht Attitude Scale—is reviewed in some detail, including the rather unpromising results obtained. Subsequent research has provided evidence that changes in attitudes are possible⁹ and that some groups of high-risk drivers can be identified in advance for insurance-rating purposes.¹⁰ In general, however, a tremendous amount of effort and money is being expended on attitude-change programs without adequate evaluation in terms of actual changes in behavior or accident frequency.

ONE OF THE MOST POPULAR terms in referring to the habitual violator is that of "attitude." Faulty, erroneous, and misconceived attitudes are variously ascribed to drivers or held responsible for traffic accidents and violations. In addition, methods of changing these attitudes range from educational programs to the correctional sentencing of individuals to penal servitude.

The term, as Allport points out, has grown in popularity with psychologists since 1862 when Herbert Spencer used it in the work, *First Principles*. Since that time, its use has increased to the point where some psychologists have tended to believe that attitude is the most important concept in social psychology. At times it replaced many of the more detailed concepts in human motivation such as drives, urges, and wishes. From the viewpoint of the psychologist who desired to build a theoretical structure, it had the advantage of having a number of interpretations of meaning, either narrow or broad in implication.

As Allport remarks, "The concept of attitude is probably the most distinctive and indispensable concept in contemporary American social psychology. No other term appears more frequently in experimental and

theoretical literature. Its popularity is not difficult to explain. It has come into favor, first of all, because it is not the property of any one psychological school of thought, and therefore serves admirably the purpose of eclectic writers.

"Furthermore, it is a concept which escapes the ancient controversy concerning the relative influence of heredity and environment. Since an attitude may combine both instinct and habit in any proportion, it avoids the extreme commitments of both the instinct theory and environmentalism. The term likewise is elastic enough to apply either to the dispositions of single, isolated individuals or to broad patterns of culture."

Attitudes have been described by some writers as the motive power and the stabilizer of the direction in which the activity will take place. However, others believe that attitudes do not furnish the motive power for a pattern of action but only afford the direction in which the action will take place. If Allport's conclusions concerning the concept of attitude are correct, and if we have two groups of attitudes—those that motivate human action and those that act as the directors in which the action will take place—then it is entirely possible that atti-

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tudes may directly affect the driving behavior of an individual. His driving may be the result of his motivational pattern of attitudes.

Before we agree completely with this assumption, however, an investigation should be made of the vast and unexplored area between the motivational function of attitudes and development of individual habit patterns. While attitudes are subject to change, and while these changes may be rapid, habit patterns are not subject to rapid modification and may require years to bring about changes in their structure.

DRIVING ATTITUDES DEFINED

In the field of driver behavior, the need for further research into the relationship between attitudes and behavior is most evident. Some investigators have limited their definitions of attitude to that of "the acceptance of a belief" with no assumption being made as to the relationship of this belief to the resulting behavior of the individual. On the other hand, Stack has concluded that definitions of attitudes have in common the following points:

"(1) Attitudes are more or less emotionalized; (2) they are acquired from personal experience; (3) they are as many and varied as the situation to which they are a response. *Attitudes influence behavior.* Therefore, driving behavior that creates a hazardous situation either for the driver himself or for others, may be said to be evidence of bad attitude." Unfortunately, the investigation of either of these two hypotheses has been handicapped by a problem that is common to much of this form of research, that is, the lack of suitable behavioral criteria against which to validate the results of attitude studies.

If it is admitted that attitudes are important in determining whether an operator shall or shall not be classed as negligent in his operation of a vehicle, there still remains the unsolved problem of how his attitudes were formed. Agan, using the *Conover Driver Attitude Inventory* and administering it to a group prior to a course in driver training and subsequent to the training,

reported that significant shift in scores occurred. The inference may be drawn that attitudes as measured by the Conover scale are subject to modification, and that some of this modification may be on an educational level. Yet, the mechanisms and patterns that aid in formulating the earlier attitudes of the individual still remain unexplored.

Little or no information is available as to the desirability or undesirability of certain attitudes in the driver other than by students of the problem such as Selling, who, through his psychiatric experiences at the Psychopathic Clinic of the Recorder's Court, Detroit, was led to conclude that attitudes may be classified as "... temporary or permanent. A temporary attitude is the type which is found in an individual when he drives to work after having insufficient sleep, an argument with his wife ... (and such). ... Permanent attitudes are classified further as being passive and active. Passive attitudes are less likely to be troublesome in traffic than active attitudes, but they cannot be ignored.

"It must be remembered also that there is no such thing as an individual whose behavior is characterized entirely by a single attitude. A man who is blasé may also have a bored attitude. He may be conceited; he may have a number of other traits. When we discuss the types of attitude which we find in our drivers, therefore, particularly those of a permanent nature, we are dealing with the dominant trait only. Each individual who has that dominant trait may have a number of others almost as important, which differentiates him from every other driver who falls in the same class."

Selling, following his general hypothesis, grouped his drivers' attitudes under two different headings, "passive and active dangerous." He listed the passive attitudes as consisting of (1) indifferent attitudes, (2) rural attitudes, (3) blasé attitudes, (4) the lazy driver, (5) the euphoric attitude, and (6) the overcautious attitude.

He stated that the active dangerous attitudes are (1) attitude of tenseness, (2) overassertive attitude, (3) the arrogant attitude,

(4) the belligerent attitude, (5) the egotistical attitude, (6) the irritable attitude, (7) the unstable driver, and (8) the resentful attitude. Unfortunately, Selling—like many other investigators—did not furnish the experimental or statistical proof of how we can actually measure the attitudes and determine their relationship to the behavior of the driver.

METHODS OF CHANGING DRIVING ATTITUDES

The problem of modifying attitudes of drivers, particularly negligent operators, has followed to a great extent the classical techniques established in social psychology. One approach has been the attempt to modify attitudes through exposing the individual to a situation about which he is presumed to have poor attitudes. An example of this is the taking of an individual to see the results of an accident in which speeding was involved.

A second approach is a modification of the techniques used by Thurstone. This consists of exposing the individual to a motion picture designed to bring out the favorable or unfavorable attitudes. Motion pictures that negligent operators have been forced to watch which show the results of excessive and poorly managed speed are examples of this.

A third procedure is the educational one of teaching the driver *correct* attitudes during driver training courses. Agan, Conover, and Siebrecht have used this technique individually and have tested subjects prior to and subsequent to driver training courses. They report significant shifts in the direction of desirable attitudes. One problem still is that slight shifts often seem to occur toward undesirable attitudes in some individuals. Whether this is the result of the training or factors inherent in the design of the attitude scales has not been resolved. It has been shown, however, that the scores on both the Siebrecht and Conover scales may shift on the basis of the type of directions given.

A fourth technique exposes individuals to a lecture on the situation for which the atti-

tude is being measured. Where this technique has been used in social psychology, modification of attitude has usually been found to take place as the result of the lecture to which the individuals listened.

A fifth method uses the effect of printed arguments and propaganda to mold the attitudes of individuals. It has been employed extensively in safety and negligent driver campaigns aimed at changing the attitudes of individuals. The effects of these campaigns on the driving attitudes of the general public or any specific class of drivers which may be named are generally unknown.

Social scientists have studied the effects of radio and group discussions in the modification of individual attitudes. Unfortunately, little if any controlled experimentation has been made to determine whether modifications of driver attitudes or behavior are produced through these media. The result is that thousands of dollars are expended in an effort to shift the attitudes of individuals without adequate knowledge of the relationship these attitudes bear to the actual behavior of the individual, and without adequate knowledge of the effect of the various modification techniques in the change of individual behavior.

ATTEMPTS TO MEASURE DRIVING ATTITUDES

At present, only two scales have appeared commercially to measure attitudes of the driver. These two scales are based on different premises.

Conover Driver Attitude Inventory: This inventory assumes that attitudes are generalized and carry a deep-seated emotional connotation. In 1947, Conover selected items from the *Iowa State Multi-Attitude Scale* to represent the ten most frequent causes or conditions of accidents as given by the National Safety Council in annual statistical reports. This method involves the premise that the items selected for the scale were related to types of behavior leading to these ten types of accidents. Conover attempted to measure driver attitude by ascertaining an individual's reaction to a word or phrase

such as *liquor parties* in terms of a five-point scale ranging from "highly unpleasant" to "very pleasing." Conover reported his scale to be reliable.

Conover assumed that deep-seated emotional responses to his scale can be modified through education. As mentioned before, when retested on the scale following training, most of the individuals did show shifts toward the desirable attitudes; however, some individuals showed shifts toward the undesirable attitudes. It is conceivable that some of his conflicting results were brought about by the fact that the training may have activated dormant conflicts, thus producing a shift in the negative direction of the attitudes.

Siebrecht Attitude Scale: This scale, developed in 1941, uses the technique of presenting to the individual a series of complete sentence statements about factors involved in driving, such as passing on hills and curves, enforcement of traffic regulations, traffic violations, and condition of drivers. The individual indicates his reaction toward the attitude expressed by the statement in terms of a five-point scale ranging from "strongly disagree" to "strongly agree." One statement is the following: "The driver of a car should decide when it is safe to pass on curves . . . strongly disagree . . . disagree . . . undecided . . . agree . . . strongly agree."

It will be noted that this scale deals with fairly specific situations and thus is assumed to be tapping different attitudinal areas from the Conover scale. A split-half reliability of .81 is reported. Siebrecht, in giving his scale to high school and college students, found significant differences between the means of these groups, the mean score increasing progressively for increasing grade levels. This may indicate that individuals with increasing knowledge and experience were more able to select the correct attitude.

Other attempts have been made to determine the attitudes of certain differentiating groups of drivers. In 1948, the Eno Foundation conducted a study of accident repeaters and accident-free drivers in Michigan (where

no immunity was promised) and in Connecticut (where the individuals were promised immunity). The chi square technique was applied to test the significance of the differences between the accident repeaters and accident-free drivers. In Connecticut, the repeaters exhibited a significantly stronger tendency than the accident-free drivers to agree that:

"Driving is a competitive affair in which each operator is out for himself.

"Almost anything can be fixed up in the courts if you have enough money.

"Success is more dependent on luck than on real ability.

"The decisions of judges in courts are determined mainly by their personal prejudices."

However, in Michigan no significant differences were found between the repeaters and the accident-free drivers in the attitudes which these items measured. The Michigan repeaters indicated different attitudes, believing that:

"They had often been punished without cause.

"If several people find themselves in trouble, the best thing for them to do is to agree upon a story, and stick to it.

"It is all right to get around the law if you don't actually break it."

This study concluded that attitudes toward certain aspects of driving are significantly poorer among repeaters.

OTHER STUDIES OF DRIVER ATTITUDES

In 1939, a study was conducted in Connecticut in which the test results of 3,663 drivers were compared with their accident records. It was found by Lauer, one of the investigators, that selected items of the *Iowa State Multi-Attitude Scale*, from which the Conover scale was developed, gave the following correlations with accident records: Attitude toward traffic (+.084), attitude toward society (+.026), and attitude toward risks and annoyances (-.005). These low relationships (which are about as high as any obtained by the other so-called driver tests) are explained in part on the basis of

the impossibility of being able to know the real extent of accidents as related to the group.

In 1940, Lawshe mailed questionnaires to 297 automobile owners whose car speed had previously been recorded on the highway and about whom other information had been gathered. The survey was made by postal card and included the following questions:

"What is the fastest speed at which a motorist may travel with safety on the open highway, on a good concrete or blacktop road, in the daylight and in dry weather?"

Check below *one cause* which you believe is responsible for most highway accidents:

- ☐ Driving too fast
- ☐ Failing to signal to other drivers
- ☐ Driving on wrong side of road
- ☐ Passing when unsafe
- ☐ Disregarding signs and signals
- ☐ Other causes

Lawshe received replies from 107 automobile owners, 104 of whom indicated a maximum safe speed for the open highway. He found a significant relationship between the maximum safe speed as expressed, and the recorded speed on the highway, the coefficient of correlation being $.46 \pm .08$. In general, those who expressed high-speed maximums drove faster, but relatively few drivers exceeded their own maximums.

In 1948, Tillmann, using a psychiatric approach, concluded from a study of accident repeaters and good drivers that his high-accident group appeared to possess selfish, impulsive traits, and that the accident repeater was marked by his antisocial behavior. The good drivers showed a high degree of stability and mature characteristics.

In 1952, Uhlaner and his associates investigating Army drivers, found that the "safe drivers tend to be more tense, less self-sufficient, less dominant, as shown by the *Bernreuter Personality Inventory*. These same trends are demonstrated on the MMPI test (hypochondriasis and hysteria scales) even though differences were not shown to be

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statistically significant." This conclusion does not agree with the premise set forth by psychiatrists, such as Selling, that an attitude of tenseness is predisposing toward negligent operation.

RESEARCH MAY PROVIDE BASIC ANSWERS

Within the last few years, research into driving attitudes and their relationship to violations and accidents has produced conflicting results and results which it appears almost impossible to validate. Yet, many authorities continue to promote the changing of the individual's attitudes as the solution to violations and accidents, perhaps not heeding the fact that social psychologists have been unable to demonstrate successfully the inter-relationship between specific behavioral habits and the attitudinal matrix of the individual.

The fact is also disregarded that we have little or no knowledge concerning the effect that modifying the attitudes of the individual will have upon his behavior. As a result, much money, energy, and time have been expended in attempting to change the attitudes of drivers when we have little if any verifiable evidence as to what constitutes desirable attitudes from the viewpoint of safety to themselves and others. How much more effective would be our efforts to make the individual safety-conscious and law-abiding if we knew the keys which would successfully unlock the individual's undesirable driving habits and allow us to remold them!

Probably a great saving in time, money, effort, and human grief could be effected if a fraction of the money that now goes into campaigns based upon intuitive guesses aimed at changing drivers' attitudes were devoted to systematic research in this field. Such research may be designed to provide basic answers to the following important questions: (1) What are the differences between attitudes of habitual violators and normal drivers? (2) How are these attitudes related to driving habits? (3) What effect does modifying the attitude have on the

habit? (4) What is the most effective method of modifying the attitude? and (5) How can the habit be changed?

SUMMARY

Social psychologists have long recognized attitudes as being important determiners of human activity both in formulating and directing the pattern of behavior and in furnishing the motivation for that behavior. Considering the importance of the concept of attitude in psychology and related fields, it is surprising that so little actual research has been forthcoming to determine its re-

lationship to the automobile driver and the deviates in this driving population, the habitual traffic violator and the accident repeater.

The greatest proportion of reported work in the field consists of expert opinion; only two commercial scales for the measurement of driving attitudes have made their appearance. The fragmentary attacks upon the problem have done little to provide basic answers to five important questions.

In conclusion, there is need for systematic and comprehensive research on the answers to these and similar questions in this field.

Considering the prominence of attitude research in sociology, it is surprising how little research has been done on driver attitudes—or on attitudes toward accidents in general. There is every reason to believe that individual and public attitudes play a significant role and that programs directed at the prevention of accidents of many types will need to be based in part on techniques that change the attitudes of the individuals involved.

SOCIAL PATTERNS OF ROAD ACCIDENTS TO CHILDREN

—E. Maurice Backett, M.B., B.Sc., M.R.C.P., D.P.H., A. M. Johnston

Few studies of accidents have examined the interpersonal relationships of individuals who have had accidents. Using the familiar design of comparing a matched accident-incurring and accident-free group, this study examines the family characteristics and relationships of children who have had nonfatal pedestrian road accidents. The results show that the accident group was more likely to come from families in which there was illness, especially serious illness, maternal preoccupation of some kind, and less opportunity for "protected" play. When the schools they attended were rated in terms of "maternal care and cooperation," the accident group was found to come more often from schools that were rated low.

These findings and the similar results obtained by Read *et al.*³ indicate that the family environment exerts an important influence upon accidents that occur not only in that environment but also in other situations. A disturbed home environment may render an individual more susceptible to accidents at school and at work. This may be especially true among young children, as in the present study, where family patterns are found to have a greater effect upon the younger than upon the older child. The mother plays an extremely important role in accident prevention among children, and the present evidence indicates that maternal preoccupation with other matters, such as work or family illness, increases the accident vulnerability of the young child. This is likely to be particularly the case among preschool children, a group whose accidents greatly need study from this point of view.

THIS PAPER presents the results of a comparison of two groups of schoolchildren and their families. One group had had road accidents (which were not fatal) and the other was a control group without a history of road accidents.

THE PROBLEM

Accidents of all kinds were second as a cause of death among children not injured or deformed at birth in England and Wales in 1956. Road accidents were by far the most important group, and accounted for one-third of the total deaths. In spite of the recent decline in death rates from road accidents in all age groups except the young adult male and the elderly female, these accidents to children are now six times as frequent as tuberculosis or pertussis as a cause of death. They may well be as important as these diseases and poliomyelitis together as a cause of crippling and deformity. Certainly they killed fifteen times as many children as poliomyelitis in 1956, and about twice as many as were killed by this disease in our worst epidemic since the war. In striking contrast to poliomyelitis, road accidents to children arouse little popular attention and have stimulated almost no research. A particularly important omission from the literature is an investigation of what Gordon calls the "host factors" in road accidents—the characteristics of the drivers and pedestrians who are involved. However, certain groups are well known to be specially vulnerable. For example, the relatively high road accident rates for males are well recognized, as are the special dangers at the extremes of age.

The small boy pedal-cyclist and the young adult motor-cyclist also carry very high risks. But many more facts than these are necessary before the vulnerable groups are defined clearly enough to focus preventive measures upon them, or even to decide what are the best means to use in prevention.

Recent studies have gone some way to achieve this end. They have taken the epidemiology of road accidents to children to a point where the relative risks at ages and for each sex can be defined. These figures suggest that for child pedestrians (among whom most road accidents occur) the risks for boys are at all ages higher than for girls. This sex difference is apparent for all road users, and reaches its peak in the young adult, where the sex ratio for all fatal road accidents is as much as 10 to 1. The risk of road accidents for both sexes increases up to 6 years of age and then begins to decline gradually, to drop sharply after 9 years. Adolescent girls experience far fewer road accidents than adolescent boys, and are among the best "risks" on the road.

A few aspects of the behaviour of children at and prior to the accident as well as the accident surroundings have been studied in detail, particularly by the Road Research Laboratory of the Department of Scientific and Industrial Research. The types of vehicles involved, the time of day, and the day of the week have also been investigated, and the police of most areas tabulate road accidents to children against a supposed cause. "Heedlessness of traffic," for example, was given recently as the cause of a huge majority of road accidents to children in England and Wales.

Study of the "host" characteristics of personality and intelligence of children involved in accidents of all types has presented great difficulties of method, and it is doubtful how much of this material may be applied in the special field of road accidents. However, the findings of Bimbach and others in the United States suggest that there may be important differences of personality between children who have accidents and those who do not. Their statement that intelligence (a factor more likely to remain constant before and after an accident than personality) is relatively unimportant may be a useful addition

to our understanding. Webb discusses the methods which may be used in investigating psychological and behavioural characteristics of persons involved in accidents. Charles, in emphasizing the importance of education for prevention, points, by implication at least, to some defect of learning which selects certain groups of people as likely to have accidents.

The process of learning how to take reasonable risks on the road has been studied in this country by Cohen *et al.* and at the Road Research Laboratory. These inquiries, as well as helping to make possible the definition of a potentially "dangerous" group, suggest methods which could be used in the detailed analysis of both pedestrian and driver behaviour. All these studies have been focused upon the individual; there have been few, other than those of Gordon, which have sought to define the family and social characteristics of the group from which the vulnerable children come and within which most of the learning about how to avoid accidents must be presumed to take place.

METHOD

A randomly selected group of school children between the ages of 5 and 14 who had had pedestrian road accidents was compared with a matched control group for the following personal and family characteristics: (a) family and maternal health; (b) maternal preoccupation—for example, with work outside the home or with other children; (c) family size and age structure; (d) poverty and prosperity of family; (e) protected and unprotected play; (f) crowding; (g) other accidents; (h) intelligence.

In addition, the distributions of accident children and others in Belfast were compared by an independent rating of parental standards and co-operation.

Population.—The Royal Ulster Constabulary provided the names of the last 250 children aged 5–14 years involved in non-fatal road accidents as pedestrians within the Belfast boundary prior to the beginning of the study. This group formed the experi-

mental accident population, and from it a random sample was drawn to give (with an estimated 10% wastage) approximately 100 accident families.

Control Children.—Matched control children who had not had road accidents were picked from the records of the school health service so that they shared the same age (to within 1½ months*), sex, school, and area of living (and therefore major variations in exposure to traffic). Because of the fact that in this city most children go to the nearest school, differences in the area of living were well controlled, many pairs of children living near one another in the same street. There were only two children among those investigated who did not go to the nearest school, and these were being educated privately. Children who did not attend schools within the city boundary, who were at boarding schools or institutions, or who were suffering chronic handicap such as blindness or skeletal defect were omitted from the study. A map check showed no reason to suppose that distances from home to school were different in the two groups, nor did any major traffic intersections differentiate between the two groups. Because of the social homogeneity of neighbourhoods in the city, large differences of social class were ruled out by this method of selection, and, because of the rigidly denominational nature of education in Northern Ireland, accident and control children were always of the same religion.

Interview.—The homes of all accident and control children were visited by a social worker (A.M.J.), and a schedule was completed at interview with the mother. Factual material was later coded "blind"—that is, without identification of accident or control.

RESULTS

(a) *Effect of Family and Maternal Illness.*—Reports of illness within the family of the accident or control child were recorded

* On five occasions the age distribution of children in the school was such that a difference in age of 2 months had to be accepted.

when the episodes had occurred at or since the time of the accident. The period involved was, of course, the same for each pair of families and was usually between three and nine months. As it proved impossible to obtain the ages of all members of the households, morbidity rates have not been calculated. However, more illness was reported among the accident families than among the controls, and these differences were significant at the 5% level (Table I). This was not

on confirmed *hospital* contacts distinguishes the accident and control families in the same way (Table I).

In order to see if the seriousness of illnesses reported by the families distinguished between them, all reported diagnoses were divided into two groups, "trivial" and "not trivial." Into the more serious group were placed the following: illnesses resulting in death or hospital in-patient treatment, as well as pleurisy, nervous breakdown, peptic

TABLE I.—ASSOCIATION WITH FAMILY AND MATERNAL HEALTH. PERCENTAGE RATIOS OF CHILDREN OBSERVED TO THOSE EXPECTED (ON THE NULL HYPOTHESIS), CLASSIFIED ACCORDING TO WHETHER ACCIDENT OR CONTROL AND PRESENCE OR ABSENCE OF PROVED FAMILY ILLNESS

TYPE OF FAMILY ILLNESS		ACCIDENT CHILDREN	CONTROL CHILDREN	NO. OF CHILDREN	TEST OF SIGNIFICANCE BETWEEN OBSERVED AND EXPECTED DISTRIBUTION
Description	Subgroup	%	%		
Family illness (excluding mother)	None reported	86.57	113.43	134	$\chi^2 = 6.41$
	Some "	126.47	73.53	68	D.F. = 1 $0.02 > p > 0.01$
Family illness (excluding mother and with index child under 9 years)	None or trivial	88.17	111.83	93	$\chi^2 = 4.779$
	More serious illness*	140.74	59.26	27	D.F. = 1 $0.05 > p > 0.02$
Maternal illness only	Involving no hospital treatment	92.94	107.06	170	$\chi^2 = 4.493$
	Involving hospital treatment	137.50	62.50	32	D.F. = 1 $0.05 > p > 0.02$

* For Criteria see text.

due to differences of family size between the groups, but could be related to age differences, particularly among the adults. Because of the notorious inaccuracy of reports of recollected illness, more objective evidence was sought. Details of the diagnosis and the names of the doctors or hospitals involved had been recorded, and all hospitals and general-practitioner contacts were traced for an equal-sized sample from both accident and control families. The expected irregularities of memory were encountered in the two groups, but were no greater in one than in the other. However, though the chances that control mothers had forgotten a *family* visit to a hospital during recent months was small, the possibility remains as an uncontrolled source of error. It is less likely still that the mothers forgot their *own* hospitalization, and an analysis of the material based

ulcer, "kidney trouble," Raynaud's disease, tuberculosis, heart failure, meningitis, chorea, blindness, gangrene, fractures, and concussion.

There was an excess of accident children among the families which reported the more serious diagnoses. This trend was not significant for all the families taken together, but was significant at the 5% level for the younger group—that is, for those with children most directly under parental control (Table I).

(b) *Maternal Preoccupation.*—The presence of a younger sibling in the family, the mother's pregnancy, and work outside the home were recorded as preoccupations at the material time. In addition there were a few families where dependent elderly relatives or some other serious responsibility could be counted a preoccupation likely to

TABLE II.—ASSOCIATION WITH MATERNAL PREOCCUPATION. PERCENTAGE RATIOS OF CHILDREN OBSERVED TO THOSE EXPECTED (ON THE NULL HYPOTHESIS), CLASSIFIED ACCORDING TO WHETHER ACCIDENT OR CONTROL AND PRESENCE OR ABSENCE OF MATERNAL PREOCCUPATION AT THE TIME OF THE ACCIDENT

MATERNAL PREOCCUPATION		ACCIDENT CHILDREN %	CONTROL CHILDREN %	NO. OF CHILDREN	TEST OF SIGNIFICANCE BETWEEN OBSERVED AND EXPECTED DISTRIBUTION
Description	Subgroup				
Maternal pre-occupation (sib., preg., work, other)	Not preoccupied	86.75	113.25	83	$\chi^2 = 2.045$
	Preoccupied	109.24	90.66	119	D.F. = 1 $0.20 > p > 0.10$
Maternal pre-occupation (sib., preg., work, other, with index child under 9 years)	Not preoccupied	70.00	130.00	40	$\chi^2 = 4.537$
	Preoccupied	115.00	85.00	80	D.F. = 1 $0.05 > p > 0.02$

deflect maternal attention and care from the accident or control child. The mothers of the accident children were more often preoccupied in these ways than the mothers of the controls (Table II).

(c) *Family Size and Age Structure.*—Variations of sibship size, birth rank, spacing, and age below 15 years within the accident and control families did not distinguish between them.

(d) *Poverty of Family : Dependant : Earner Ratio.*—Since there were no important differences of social class between the accident and control families, it was hoped that major differences in family finance might be reflected in the ratio of dependants to earners in the household. This ratio was found to distinguish between the accident and control families, there being an excess of accident children in the families with the higher ratios—that is, more dependants per earner (Table III).

(e) *Room to Play.*—Children were classified according to whether there was a garden, yard, or playroom at home, use of playgrounds, fields, etc., near by, or no facilities used at all. Almost all children in both groups played sometimes in the streets. Only

small differences in facilities were encountered because of the similarity of housing in the various school areas of the city. If a child was either without anywhere to play at home or without local facilities for play, or did not use them if they existed, his play was regarded as "unprotected"; others were coded as "protected." There was a significant excess of accident children both in the "unprotected" group and among those with the more objectively measured absence of garden, yard, or playroom (Table IV).

(f) *Crowding.*—Families were grouped, using as an index of crowding the number of persons per bedroom. An excess of accident children was found among the more crowded families (Table V), but this remained insignificant until the number of older children and adults was held constant. The association then became significant for the younger children only.

(g) *Other Accidents.*—Families were questioned about other accidents to relatives within the household which had occurred at or since the time of the index child's accident. Reports of trivial accidents were then separated from others which could be verified by reference to doctor or hospital, and accident

TABLE III.—ASSOCIATION WITH FAMILY "POVERTY." PERCENTAGE RATIOS OF CHILDREN OBSERVED TO THOSE EXPECTED (ON THE NULL HYPOTHESIS), CLASSIFIED ACCORDING TO WHETHER ACCIDENT OR CONTROL AND A MEASURE OF FAMILY POVERTY

A MEASURE OF FAMILY POVERTY		ACCIDENT CHILDREN %	CONTROL CHILDREN %	NO. OF CHILDREN	TEST OF SIGNIFICANCE BETWEEN OBSERVED AND EXPECTED DISTRIBUTIONS
Description	Subgroup				
Ratio of dependants to earners in household	1.0-4.0	37.50	112.50	128	$\chi^2 = 6.3948$
	4.1-6.0	131.71	68.29	41	D.F. = 2
	6.1+	109.09	90.91	33	$0.05 > p > 0.02$

TABLE IV.—ASSOCIATION WITH PLAY. PERCENTAGE RATIOS OF CHILDREN OBSERVED TO THOSE EXPECTED (ON THE NULL HYPOTHESIS), CLASSIFIED ACCORDING TO WHETHER ACCIDENT OR CONTROL AND TWO MEASURES OF PROTECTION WHILE PLAYING

A MEASURE OF PROTECTION WHILE PLAYING		ACCIDENT CHILDREN %	CONTROL CHILDREN %	NO. OF CHILDREN	TEST OF SIGNIFICANCE BETWEEN OBSERVED AND EXPECTED DISTRIBUTION
Description	Subgroup				
Household with garden, yard, or playroom	Yes	83.61	116.39	122	$\chi^2 = 7.471$
	No	125.00	75.00	80	D.F. = 1 $0.01 > p > 0.001$
Play	Protected	71.79	128.21	78	$\chi^2 = 9.210$
	Unprotected	117.74	82.26	124	D.F. = 1 $0.01 > p > 0.001$

rates were computed for the latter. No significant differences between the two groups were found, though there was a small excess of these more serious accidents (fractures, other motor-vehicle accidents, and the like) among the younger members of the accident families.

(h) *Intelligence*.—The chief educational psychologist for the city of Belfast undertook to test the intelligence of a group of the accident and control children, but reluctance on the part of some of the parents—particularly of the controls—prevented a successful experiment. Thirty-four pairs of accident and control children were eventually subjected to a comprehensive battery of tests which had been standardized locally. No differences in intellectual ability were found between the two groups.

RATING OF PARENTAL STANDARDS AND CO-OPERATION

School medical officers form opinions of the parental standards and co-operation of

parents of the children whom they see in school, and it was decided that, rough though they were, these judgments might be relevant to the accident and parental care problem in Belfast. The control series of families was not used in this part of the study, which sought confirmation that the accident families came from among the less co-operative groups of parents in the city. Three school medical officers were asked to rate upon a five-point scale* the parental standards and co-operation "generally to be found" in their experience in all the city schools. The final rating given to a school was agreed between

* *Rating 1*: The children in this school are generally clean and well turned out. They are free from vermin. Parental co-operation with the school health service is fair or good.

Rating 2: The children of this school are average in all respects which reflect maternal care. Parental co-operation is average.

Rating 3: The children in this school are habitually dirty and badly clothed. They are occasionally infested. Parents do not co-operate and are often negligent. Attendance is irregular.

Ratings 2+ and 2- are intermediate.

TABLE V.—ASSOCIATION WITH CROWDING. PERCENTAGE RATIOS OF CHILDREN OBSERVED TO THOSE EXPECTED (ON THE NULL HYPOTHESIS), CLASSIFIED ACCORDING TO WHETHER ACCIDENT OR CONTROL AND A MEASURE OF CROWDING

A MEASURE OF CROWDING		ACCIDENT CHILDREN %	CONTROL CHILDREN %	NO. OF CHILDREN	TEST OF SIGNIFICANCE BETWEEN OBSERVED AND EXPECTED DISTRIBUTION
Description	Subgroup				
Persons per bedroom	<1.6	75.00	125.00	40	$\chi^2 = 3.257$
	1.6	109.33	90.67	75	D.F. = 2
	2.5	103.45	96.55	87	$0.20 > p > 0.10$
Persons per bedroom (adults and older children constant and index child under 11 years)	<1.6	69.90	130.70	34	$\chi^2 = 3.938$
	1.6 or more	107.73	92.31	134	D.F. = 1 $0.05 > p > 0.02$

the three without knowledge of which schools were attended by the accident children. It was found that significantly more accident children than were expected on the null hypothesis attended schools rated as having poor standards and co-operation with the school health service (Table VI). This finding does not, of course, imply a direct relationship between accidents and what was assessed. Accidents could result, for example, from greater traffic congestion or more dangerous streets in the areas where

Illness rates are unimportant in this situation, for the mother is probably involved whatever the family size and age composition. Standardization of the material supported this notion and suggested that family and maternal illness are relatively isolated factors associated with accidents.

Maternal preoccupation as a factor in the vulnerability of children is also readily understood in terms of care and protection. The interaction of maternal preoccupation and other factors was examined, but the

TABLE VI—RATING OF SCHOOLS BY SCHOOL MEDICAL OFFICERS FOR MATERNAL CARE AND CO-OPERATION

	PERCENTAGE AND NO. OF CHILDREN IN SCHOOLS WITH RATING*					Total
	1	2+	2	2-	3	
Children in all city schools less accident children	14.35% (11,012)	27.95% (21,441)	35.55% (27,277)	13.43% (10,301)	8.72% (6,689)	100.00% (76,720)
Accident children in city schools	4.95% (5)	28.71% (29)	33.66% (34)	18.81% (19)	13.86% (14)	100.00% (101)

$\chi^2 = 10.510$. D.F. = 4. $0.05 < p < 0.02$.

* For details of rating scale see footnote.

there were schools given a low rating. However, map checks upon the distribution of schools given different ratings suggested that this was not the only explanation of the association.

DISCUSSION

Interaction.—The family patterns and other factors which are associated with accidents to the children in these studies can hardly be isolated one from another. A very large number of interactions between them is possible—for example, the apparent association between accidents and overcrowding might in reality be due to an association between overcrowding and households without play facilities. Some 40 of these interactions have been examined. A few of the more important positive and negative findings are mentioned in this discussion.

Family and Maternal Illness.—That any illness in a family group (either of the mother or elsewhere in the household) should render a healthy child more vulnerable to road accidents is a hypothesis which it is easy to accept in terms of a falling off in maternal care.

strength of the associations in the younger children was unaffected.

Family Size and Age.—While there were no significant differences between the accident and control families as regards family size and age, so far as the latter was known, it seems that the family patterns found to be associated with accidents have more effect upon the younger children. Several of the associations observed became statistically significant when only the younger age groups were reviewed—for example, maternal preoccupation. Yet others increased their strength—for example protected and unprotected play. These findings reinforce the logic of the notion that *family patterns* have more effect upon the younger than upon the older child and that we must look increasingly outside the family for the factors influencing risk-taking in the older child. If it is accepted that risk-taking is learned early in life, then there is evidence here that it is in the younger family that a diagnosis of vulnerability is most important.

Dependant: Earner Ratio.—In the absence of known income and within one social

class this ratio should be a fair measure of family resources. However, its use was complicated in this study by some interaction with other factors. Standardization for the number of older children and adults in a family and for protection during play, for example, appreciably reduced the association. Thus it seems unlikely that the dependent : earner ratio is associated with accidents to these children.

Play.—The association between accidents and lack of play facilities in the home is unlikely to have been affected by differences in the reliability of reporting. The assessment of "unprotected" play was not so immune. However, both associations were stronger than with other items and unassailed by standardization. These findings suggest that play facilities and protection are important and relatively independent factors.

Other Accidents.—The small excess of "serious" accidents found among the young relatives of accident children reinforces the notion that it may be the *family* rather than the *individual* who is vulnerable.

The *crowding* of the family was a significant factor only when the number of older children and adults was held constant. It was unaffected by other standardizations, which suggests that it is relatively independent as a factor associated with accidents.

Intelligence differences were not demonstrated between the small number of accident and control pairs who were tested. In spite of these small numbers it was to be expected that suggestive differences would have been observed had the two groups differed in this respect.

Parental Standards and Co-operation.—Care or negligence in the training of children for safe risk-taking may well be linked to the local "norm" of family care; but this association remains to be demonstrated, as does the existence of such local "norms."

CONCLUSIONS AND SUMMARY

In the investigation of some of the newer

health problems—of which road accidents is an example—there is a need for studies which lie between the large-scale epidemiological survey and the small sociological inquiry. Such family studies are likely to find a place in the investigation of associations between ill-health and personal habits, diet, maternal care, leisure pursuits, etc. For a variety of reasons they must rely upon the use of unsophisticated measures and techniques, and are thus only a prelude to further and more methodologically exact social-medical inquiry. Their findings often serve merely to confirm what might be guessed at by any reasonable observer. This study of 101 families in which a healthy child has survived a road accident suggests that their vulnerability was associated with one or more of the following characteristics (shown significantly less often by a matched control series): there was illness, either maternal or elsewhere in the household, and more serious illness; there was maternal preoccupation of some kind—for example, with outside work, with other children, or with pregnancy. The vulnerable family was more crowded, and it did not provide protection during play or even elementary play facilities.

Overlapping of these factors was small in amount, and family and maternal illness, preoccupation of mother, play facilities, and protection during play appear to be independent and important. Crowding (though significantly associated with accidents) appeared less important and less likely than other factors to be directly associated with accidents. Sibship size, birth rank, spacing, and age structure of family did not distinguish significantly between accident and control, nor did the intelligence of the index child or a history of other accidents in the family. The associations described were stronger with the younger index children. A rating of local schools suggested that accident children are to be found more often than might be expected among schools where parental standards are said to be generally rather low.

Although this study provides an interesting example of the case-control design applied to the study of social variables, it suffers from many of the deficiencies of this

approach. The use of only one accident as the criterion for distinguishing between the accident-incurring and the accident-free group does not necessarily provide groups of any great stability. It is not noted whether the two groups had qualitatively and quantitatively equal exposure to risk, although the fact that the members of each matched pair tended to live near one another probably reduced the exposure differences between them to some extent. In addition, no interviews were conducted with the children themselves, despite the potential usefulness of studying their own perception of their families and environments.

Nonetheless, the results of this research offer promising indications of the significance of studying family background as a factor in childhood accidents. Certainly research on parental supervision and concern should prove fruitful, but to be so it will need to investigate in more detail than was possible in the present study both environmental and social factors in the home. Probably especially important would be the kinds of interactions between family members and the attitudes and practices of the parents regarding environmental hazards and the general upbringing of the child.

TRAFFIC FATALITIES, SUICIDE, AND HOMICIDE

—Austin L. Porterfield

The following study tests the hypothesis that motor-vehicle death rates follow a pattern similar to that of suicide and homicide rates. The rationale for this hypothesis is that motor vehicles are "deadly weapons" and that the same underlying social forces determine fatalities from all three causes. Thus, this article represents an attempt to study, as a basic factor in accident causation, a society's regard for life.

Porterfield tests his hypothesis by comparing the rank order of metropolitan areas in the United States according to indices of suicide-homicide, crime, and motor traffic deaths. The resulting correlations support the proposed hypothesis. From this the author concludes that "aggressive, hazardous driving is likely to be characteristic of persons similar to those who have suicidal or homicidal or both tendencies—and vice versa." Thus we have evidence that the occurrence of at least some accidents is statistically associated with the occurrence of recognized forms of social pathology, and that consequently accidents may be indicative of dysfunctional processes within a society. Just as an accident may represent some form of maladaptive behavior on the part of the individual, a high accident rate in an area may be indicative of the degree of social disorder within that community.

THE OBJECTIVE of this study is to test the prediction that rates of death caused by motor vehicle accidents, if appropriately compared with rates of suicide and homicide by matched population groups, would prove to be similarly distributed, or positively cor-

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related with the combined rates of the latter. This prediction is based on the postulate that a significant number of drivers of "death dealing" cars, as well as their victims, have attitudes similar to those who become involved in suicide and homicide. A postulate, however, must have a rationale.

RATIONALE

Motor vehicles are "deadly weapons." They are involved in accidents accounting for nearly 40,000 deaths annually, and many more disabilities. Students of this growing problem look for technological remedies, and expect help from driver education. Signs stand out on highways to admonish, "If you drive, don't drink. If you drink, don't drive." But the fatality rate grows.

Some influences on rates of death caused by traffic accidents may be other than lack of driver education, driver fatigue, deficiencies of roads or of machines, or the fact that the driver "took one for the road." And some of these influences may have deep roots in driver attitudes which cannot be separated from a given type of personality.

For example, it may be predicted that drivers who have little regard for their own lives or the lives of others or both ("other things equal") will have higher rates of accidents than drivers who place a high value on human life. As a corollary, if the populations of some areas have a higher ratio of persons who do not value life than have other areas, it may be predicted that the former populations will experience more motor vehicle fatalities than the latter.

These hypotheses raise the problem of comparing populations with respect to their numbers who have more or less regard for life. This problem may not be completely without solution, for variations in suicide and homicide rates have been suggested as indexes of such proportions—that is, of those who lack respect for life.

If, then, it is determined that some populations have higher combined rates of suicide and homicide than have comparable populations, it follows that the former populations

will have a higher rate of fatal motor vehicle accidents than the latter. Is this prediction supported by ascertainable facts?

PROCEDURE

Following the rationale, it seems appropriate to begin by comparing age-adjusted rates of death from motor vehicle accidents with rates of suicide and homicide among white males and females in the 60 largest metropolitan areas of the United States; and, then, to make comparisons by states. These comparisons are not based on the naive assumption that a single factor "causes" the results, or that all related variables can be known. Passenger-mile rates of traffic fatalities, for example, cannot be computed for metropolitan populations, or for any other units smaller than states. The aim, however, is not to match out a great number of separable factors, but to test the prediction that a positive relationship exists between two statistical series.

The source of the data on which the first comparison is based is *Comparative Mortality Among Metropolitan Areas in the United States, 1949-1951: 102 Causes of Death*, which includes 163 metropolitan areas. The data employed here are limited to 60 of these areas for the period 1949-1951. Because the proximity of the data to the decennial census contributes to the accuracy of the estimates, no later estimates on rates in metropolitan areas are employed.

The age-adjusted rates of death caused by motor vehicle accidents per 100,000 white males in all 163 areas is 27.8. The metropolitan suicide rate (18.5) and the homicide rate (3.4) are combined. The sum of the two (21.9) is readily comparable with the rate of motor vehicle fatalities area by area.

The nature of this comparison becomes clear in Table 1. The table contains index scores for all rates among males and females, treated as separate categories, in 39 of the 60 metropolitan areas—the 39 areas in which the suicide-homicide rates among white males rise above 115 per cent of the all-metropolitan rate of 21.9 or fall below it by

15 per cent or more. For example, Houston's combined male suicide-homicide rate (35.1)

TABLE 1.—INDEXES OF AGE-ADJUSTED RATES OF SUICIDE-HOMICIDE AND MOTOR TRAFFIC FATALITIES AMONG WHITE MALES AND FEMALES IN LARGE METROPOLITAN AREAS, 1949-1951

Metropolitan Areas	SUICIDE-HOMICIDE INDEX		MOTOR TRAFFIC DEATHS INDEX	
	Males	Females	Males	Females
Houston	160	117	150	111
San Diego	153	113	188	178
Seattle	151	130	100	100
Denver	149	146	113	122
San Francisco-Oakland	142	175	125	122
Tampa-St. Petersburg	134	147	125	122
Los Angeles	134	143	113	133
San Antonio	132	115	125	111
Phoenix	129	134	225	167
Nashville	128	101	150	111
Portland	126	100	125	111
Charleston, W. Va.	121	110	163	111
Richmond	121	143	138	78
Miami	117	147	113	148
ledo	117	100	138	144
Louisville	116	109	125	111
Indianapolis	116	115	125	122
All metropolitan areas*	100	100	100	100
Columbus, Ohio	85	88	100	111
Pittsburgh	85	97	88	67
Syracuse	85	70	88	89
Newark-Jersey City	85	106	63	44
Bridgeport	85	112	63	67
Akron	83	123	113	89
New Haven	83	88	63	56
Detroit	81	97	125	122
Philadelphia	81	82	75	67
Cleveland	80	94	88	78
Milwaukee	79	66	88	100
New Orleans	79	67	75	67
Rochester	78	97	88	78
Buffalo	74	56	100	89
Wilkes-Barre-Hazleton	74	60	75	67
Springfield-Holyoke	73	78	63	67
Boston	73	76	63	56
Worcester	73	73	63	56
New York	72	92	50	56
Albany-Schenectady-Troy	69	75	88	89
Fall River-New Bedford	60	76	63	44
Providence	60	60	63	44

is 160 per cent of the all-metropolitan rate of 21.9; but the rates in Fall River-New Bedford and in Providence are 13.1 or only 60 per cent of the all-metropolitan rate. Hence, if these percentages are treated as index numbers, Houston's suicide-homicide score becomes 160, while the score for each of the two latter areas falls to 60. The index scores for motor traffic fatalities are determined in the same way.

OUTCOMES OF THE COMPARISON

When the two series for males (including all 60 areas)⁷ are compared (for the Pearsonian ρ), the relationship proves to be highly positive (.70).⁸ For females, ρ is .45. If the homicide rate alone is compared with deaths from motor mishaps among males, the coefficient is .59, and among females, .53. If the suicide rate alone is compared with motor accident deaths among men, the coefficient is .47, and among females, only .29.

As it has been shown elsewhere, some populations more readily express frustration through suicide and others through violence against others. But both tendencies need to be included in the present comparisons.

Since men preponderate among drivers, and women more often occupy the adjacent "suicide seat," it is pertinent to compare male suicide-homicide rates with female auto death rates. When this comparison is made by correlating the two series (as in columns 1 and 4 of Table 1), the coefficient is .61. It may be of interest that the relationship of the male suicide-homicide series is statistically closer (.61 as compared with .53) to the female traffic death series than the female suicide-homicide series is to the female traffic death series. More needs to be

⁷ The areas with indexes above 100 but less than 115 among white males are Allentown-Bethlehem-Easton, Atlanta, Baltimore, Birmingham, Cincinnati, Dallas, Fort Worth, Kansas City, Knoxville, Norfolk-Portsmouth, Washington, and Wheeling-Stuebenville. Those with indexes below 100 but above 85 are Chicago, Dayton, Hartford, Memphis, Minneapolis-St. Paul, Oklahoma City, St. Louis and Youngstown.

⁸ S.E. < .04.

* All areas of the 60 compared that deviate less than 15 per cent from the mean rates of suicide-homicide among white males are omitted in this table. Let 100 in column 1 equal the rate 21.9; in column 2, 7.1; in column 3, 27.8; in column 4, 9.7.

known about the variables involved in this comparison.

OUTCOME BY STATES

Since the flow of traffic in and out of metropolitan areas is a factor in traffic fatalities, it is important to compare areas as large as states in which this flow is less pronounced, and in which there is a more exclusive interplay of resident drivers and pedestrians. Therefore, the suicide-homicide and traffic fatality rates have been compared by states. Crime rates, as reported in *Uniform Crime Reports*, adjusted to changes in population to 1955, have also been included in the comparison, as well as the variable of auto death rates per 100,000,000 passenger miles.

The results of these comparisons are partially shown in Table 2, which contains index scores for the designated conditions in the top fourth and the bottom fourth of the states during the period 1954-1956. The index of motor traffic fatalities in the first column is for the total population by 100,000,000 passenger miles (1954-1956). The mean annual rate in the nation was 6.5 (which represents the score 100). The index of traffic deaths among white males per 100,000 is shown in the second column. The mean annual rate was 33.3 per 100,000 white males of all ages (1954-1956).

The male white suicide-homicide index score of 100 for the nation is based on a mean annual rate of 20 per 100,000 in this category (third column, Table 2). To expand the data so as to include an index of a reckless attitude toward property as well as life, which seems to be the attitude of numerous drivers toward their own autos, the mean of the indexes of six offenses (murder, burglary, aggravated assault, robbery, larceny, and auto theft) during 1954-1956 is shown in the fourth column of Table 2.

A positive relationship exists between the passenger-mile traffic death rate and suicide-homicide rate among the male white population (ρ .72). Between the passenger-mile death index and the six-offense crime index

TABLE 2.—INDEXES OF MOTOR TRAFFIC FATALITIES, SUICIDE-HOMICIDE, AND MAJOR CRIMES KNOWN TO THE POLICE, COMPARED BY STATES, 1954-1956

States	INDEX TRAFFIC DEATHS		INDEX SUICIDE AND CRIME	
	Total population; by miles traveled	White males per 100,000 population	Suicide-homicide, white males	Major crimes total population
New Mexico	155	156	86	114
Arizona	151	154	133	176
South Carolina	148	142	107	115
Nevada	145	180	236	188
Alabama	140	148	121	142
Kentucky	140	125	114	174
Wyoming	128	182	146	70
Idaho	128	147	110	70
Louisiana	126	115	86	135
Georgia	122	143	126	164
Montana	122	149	144	91
Arkansas	120	123	67	113
United States	100	100	100	100
Colorado	88	114	131	121
Minnesota	86	94	85	60
New York	83	63	74	88
Nebraska	82	112	97	62
Washington	77	86	129	91
Pennsylvania	75	80	86	75
Maine	69	87	113	43
New Hampshire	68	85	100	27
Rhode Island	60	45	54	54
New Jersey	58	63	72	64
Massachusetts	57	52	61	50
Connecticut	52	64	88	49

in the total population ρ is .62. The suicide index is not included here because it should not be combined with the crime index.

SUMMARY AND CONCLUSION

The prediction that rates of death caused by motor vehicle accidents are positively correlated with suicide-homicide rates is supported by comparisons of the data. No doubt other factors contribute to the observed positive relationships. But it was the driver attitude rationale that led to the comparison of given variables, not such other factors as differences in social structure, mobility, composition of population, and social controls. Whatever factors play a part in the positive correlation of suicide-homicide, other crimes, and accident death rates, there is no reason to doubt that aggressive, hazardous driving is likely to be characteristic of persons similar to those who have

suicidal or homicidal or both tendencies—and *vice versa*.¹³

The metropolitan data (1949–1951) and the data for the states (1954–1956) leave little room for such a doubt. They suggest, however, the need for further research which will incorporate case studies of accident prone drivers, and which will seek information about attitudes of drivers and riders and about their family, class, educational, and vocational backgrounds. It might be

¹³ One reader comments that "the results are consistent with the rationale; and it is a plausible rationale." Still, what is shown is not quite this. If areas with high rates of the one have high rates of the other, "it is quite conceivable that the same general conditions that generate the suicide prone and the homicide prone also generate the accident prone, but that different people are involved—e.g., different sorts of personalities react respectively in one or the other way to those general conditions. The logic is the same as that involved in any ecological correlation, and it might be appropriate to note such a possibility."

We may well note this possibility. But just what would lead the investigator to begin with the

enlightening, for example, to take a census of a sample of wrecked-car cemeteries and to study the "life-histories" of automobiles and their owners. But sociologists have shown little interest in traffic behavior. If this comparison of suicide-homicide rates with rates of death from traffic accidents stimulates further research, it will have served an important purpose.

prediction that "the same general conditions that generate the suicide prone and the homicide prone" would "also generate the accident prone?" Could he make a prediction about similarities of the milieu that produce given types of personality without a prior consideration of the similarities of these types? If he should do so, what would lead him to the hypothesis that similar ecological conditions are the common source of suicidal, homicidal, and accident prone people who behave in different ways because they may have developed into "different sorts of persons" in similar ecological backgrounds? Such a rationale would have to make room for a milieu which produces a positive correlation between different types of behavior and, at the same time, the "different sorts of persons" who "react respectively in one way or the other" to yield these positively correlated "different" types of response.

Although the results of this analysis are interesting, they are subject to the same criticisms that might be leveled against any conclusions based on purely statistical correlations without ancillary evidence. Covariation of group rates is insufficient evidence of causality, because independent factors may be responsible for the differing rates, or both may result from a common cause rather than one from the other. Furthermore, group rates may not be indicative of individual relationships. However, the major point made here concerns the probable importance of differing social climates. It would appear from these results that areas showing a higher rate of suicide, homicide, and crime are likely to show also a higher accident rate. Additional research is necessary to determine the dynamics of this correlation, but the present results offer a good example of the analysis of social factors that may underlie accidents.

In any such broad comparison, one is apt to be dealing with indices of unknown reliability and validity. Different localities will use different definitions of such variables as suicide, homicide, crime, and accidents. Reporting will not be done with equal accuracy and diligence. Records are also likely to be incomplete, especially in relation to such variables as crime and accidents. Thus high rates of crime and accidents in an area may simply reflect a greater concern with reporting rather than an actually higher rate of occurrence. This is less likely to be true, however, in the case of fatal accidents, although the picture is muddled by the fact that some suicides and homicides are undoubtedly classified as accidents, particularly in areas lacking competent medical examiners.

TRAFFIC LAW VIOLATION: A FOLK CRIME

—H. Laurence Ross

One important sociological approach to accidents examines the position of accident prevention in the value system of the society and the individual. The control of accidents sometimes involves a conflict of values between prevention, which often has a negative tone, and accident-favoring behavior, which is often positive. For example, there appears to be such a conflict between restrictions on driving speed and the full utilization of the mechanical potential designed, built into, and advertised in the modern vehicle. In fact, it might be argued that such conflict is inherent in all risk-taking behavior and that the result in accidents is largely a function of the balance achieved between the extremes of totally safe and totally dangerous behavior. This, however, is an unjustified oversimplification, since, as we have repeatedly emphasized, behavior is not the sole determinant of accident occurrence. In addition, there are many approaches to accident prevention other than those based solely on the restriction of individual actions—for example, through product modification and other environmental changes.

Attitudes toward compliance with traffic laws and regulations may be one of the most significant social values related to traffic accidents. In the following article, Ross presents an insightful analysis of traffic law violations as "folk crimes"—i.e., crimes that are ignored or even condoned and that involve a "lack of congruence between the new laws and established mores." By examining the relationship between law violations and occupational class, Ross finds that the proportion of white-collar workers is higher in traffic crimes than in non-traffic crimes and that the "status distribution of traffic violators is close to the distribution of the total male labor force in most cases." This would indicate that violations of the traffic laws constitute a type of crime which, although costly to society, is usually condoned by public opinion and is difficult to control through rigid enforcement.

The condoning attitude of the public toward the traffic offender is reflected in numerous ways. First, the recipient of a traffic summons is more often regarded as the unfortunate victim of an arbitrary enforcement officer enforcing an unreasonable statute rather than a law-breaker who has been properly apprehended. Secondly, the bystander who would readily report a burglary or a boisterous party to the police is unlikely to report a dangerous traffic violation. Thirdly, both the press and the public periodically raise an outcry about traffic courts and violations bureaus which, through overcrowding or through the brusqueness of their personnel, "treat the traffic violator as though he were a criminal." Ironically, when the offender is a juvenile delinquent or a petty larcenist rather than a violator of the traffic code, these protesters often raise a different outcry—that court procedures and prison conditions are "too soft" and tend to "coddle" the offenders.

The possible reasons for this attitude are several. Few drivers (and increasingly this means few adults) have never in their lives received a traffic summons, and even fewer can claim that they have never violated the law. Virtually none can claim that he has no close acquaintance with offenders. Hence the "social distance" between the driver and the offender is small. It may be that familiarity with violations and violators breeds contempt for the law. It may also be that many traffic laws, because

they are as irrational, unrealistically based, and idiosyncratically enforced as laws governing divorce and sex offenses, are deserving of public contempt.

The judicial attitude toward traffic offenders also reflects a tendency to remove such violations from the realm of criminality. This is reflected in the wide use of violations bureaus for convenient payment of fixed penalties, nonpunitive sanctions, such as attendance at traffic safety schools, and such penalties as restriction of privilege by suspension of licenses rather than restriction of freedom by imposition of jail sentences. These factors tend to make traffic fines one of the "costs of doing business" and thus remove the violator from public censure. In a large measure, the law-enforcement agencies themselves do not view such violations as crimes. To some extent this is the result of a system that could not conceivably manage the enormous number of violations in any other way.

VIOLATIONS of the traffic laws are the most common form of reported crime in the United States, and the accidents associated with these violations are perhaps the most costly of our social problems. In 1958, 37,000 people died in auto accidents in this country. In that same year, 3,850 cases of murder and non-negligent manslaughter were reported to the F.B.I.—a ratio of ten traffic fatalities to every murder. A most conservative estimate of injuries received in traffic accidents is 1,350,000, as compared with 72,460 cases of aggravated assault reported for the same year. Property damage to the amount of almost two billion dollars was accumulated in traffic accidents, compared with \$266 million stolen by thieves, and more than half the latter was recovered, while the damage from accidents represents a total loss. The combined costs of wage losses, medical expenses, and insurance overhead because of traffic accidents in 1958 are estimated to be \$3.7 billion, in addition to the costs of property damage.

This paper will offer support for the hypothesis that accidents are generally the result of law violations. It will suggest resemblances and differences between traffic law violators and other types of law violators, with particular attention being paid to the "white-collar criminal." It will further point to significant trends in law and procedure concerning traffic law violators.

LAW VIOLATIONS AND TRAFFIC ACCIDENTS

It should be recognized that the highway is a social situation, in which people are interacting. However, the highway is a very special kind of social situation. Drivers are typically anonymous, and interaction between them is brief and non-recurring. Communications are limited in content and are mediated through mechanical aids, such as lights and horns. Despite these conditions unfavorable to social order, the highway is a place of impressive orderliness in which accidents are rare events. Social control on the highway is maintained in large part through the traffic law.

The manifest function of the traffic law is to minimize conflict between vehicles traveling on the highway. It does so through several means. Some of the laws, which can be called rules of position, allocate the use of parts of the highway according to the direction and speed of the vehicles. Examples are lane laws, passing regulations, and the like. A second group of laws, which can be called rules of priority, determines an order of precedence at intersections. Examples are rules pertaining to stop signs, traffic signals, and similar devices. A third group of laws, which can be called rules of responsibility, requires drivers to possess a minimum level of competence in manipulating the automobile and understanding other laws regulating driving, as a condition of using the

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Portions of the text and 1 table have been omitted.

public roads. Examples are laws concerning possession of a driver's license and driving under the influence of intoxicating beverages.

It is, of course, true that a violation of one of these laws is not sufficient for an accident to occur. Moreover, the probability of an accident resulting from a given law violation is extremely low. On the other hand, there is evidence that a law violation may be necessary for most traffic accidents. According to the National Safety Council, violations of a traffic law were reported in 88 out of every 100 accidents in 1958. Since police tend not to report suspected violations where they believe a conviction is unlikely, this figure probably underestimates the true proportion of accidents involving law violations. Furthermore, a correlation between law violations and participation in accidents has been demonstrated in the literature, lending further support to the posited relationship.

In sum, it is suggested that traffic law functions to maintain order on the highway, and that violations of this law result in accidents. The responsibility that law must assume for order is particularly great in the realm of traffic, where other forms of social control are limited in their effectiveness.

TRAFFIC LAW VIOLATION AND WHITE-COLLAR CRIME

* * *

Lack of Social Stigmatization: While traffic law violation fits the above definition of crime, it appears that in most cases it is not considered in public opinion to be "real" criminality, and it has generally not been treated as a subject for criminological study. In these aspects, traffic law violation resembles the activities that Sutherland termed "white-collar crime." Sutherland designated by this term those law violations engaged in by high status people while pursuing a white-collar occupation. Traffic law violations and white-collar crime have in common the fact that they are illegal acts which are not stigmatized by the public as criminal. The remainder of this section will

probe other parallels between these two groups of illegal acts.

Social Status of the Traffic Law Violator: Sutherland's "white-collar criminals" come from the ranks of business and professional men. An idea of the social status of traffic law violators, as compared with white-collar criminals, can be obtained from the following tables. Because of the obvious limitations of these tables in terms of the populations studied and the criteria of social status utilized, they should be interpreted as suggestive rather than as demonstrative.

Table I is based on the police files in Evanston, Illinois, for the past ten years. Seventeen common traffic violations and nine common non-traffic violations were chosen for study, and the files were systematically searched for thirty cases of each offense. The occupation of the offender was noted in each case. Persons with the occupation of "housewife" and "student" were excluded from the sample because of the difficulty of classifying these occupations in terms of social status.

The proportion of violators with white-collar occupations was computed for each offense category. Since the white-collar proportion of the male labor force in this community is .67, it can be seen from Table I that traffic law violators have a higher social status than violators of other criminal laws, and that the status distribution of traffic law violators is close to the distribution of the total male labor force in most cases.³ This is particularly true for violators of position and priority rules.

* * *

Prevalence of Traffic Law Violation: One of Sutherland's reasons for concern with white-collar criminality was the lack of recognition, among the public and among criminologists, of the numbers of violations being committed. In this respect, traffic law

³ As the sample, omitting students and housewives, contained less than ten percent females, the male labor force was considered the appropriate base for comparison.

TABLE I.—PROPORTION IN WHITE-COLLAR OCCUPATIONS AMONG VIOLATORS OF SELECTED LAWS IN EVANSTON, ILLINOIS, 1949-1959

Violation	Type	Proportion white-collar*
Improper left turn	Traffic—position	.87
Improper right turn	Traffic—position	.73
Disregarding red light	Traffic—priority	.73
Disregarding stop sign	Traffic—priority	.73
Disregarding flashing red	Traffic—priority	.70
Passing in intersection	Traffic—position	.70
Wrong way on one-way street	Traffic—position	.70
Failing to yield right-of-way to automobile	Traffic—priority	.63
Reckless driving	Traffic—responsibility	.53†
Following too closely	Traffic—position	.50
Speeding	Traffic—position	.50
Failure to signal	Traffic—position	.43
Driving on the left	Traffic—position	.43
Leaving scene of accident	Traffic—responsibility	.40
Failure to yield right-of-way to pedestrian	Traffic—priority	.37†
Drunken driving	Traffic—responsibility	.37
Obtaining money under false pretenses	Non-traffic	.36
Disorderly conduct	Non-traffic	.23
Narcotics	Non-traffic	.22‡
Driving after license is suspended	Traffic—responsibility	.20
Petty larceny	Non-traffic	.20
Non-support	Non-traffic	.17
Assault	Non-traffic	.13
Burglary	Non-traffic	.10
Intoxication	Non-traffic	.07
Gambling and prostitution	Non-traffic	.06§

* N = 30, unless otherwise specified.

† N = 15

‡ N = 24

§ N = 18

violation resembles white-collar crime. The volume of traffic offenses is overwhelming when compared with all other reported offenses, and probably also surpasses the volume of white-collar criminal activity which is given administrative treatment and thus is not included in statistics of reported crime. The American Bar Association reports that in 1955, in 889 cities, there were 21 million traffic cases filed (including parking), of which 8.5 million were "moving" violations (excluding parking). These figures can be compared with the 2.2 million non-traffic offenses of all types reported to the F.B.I. from 1,586 cities—and more than half of these were the minor charges of drunkenness and disorderly conduct. Similarly, Wooton reports that, in Britain, motorists constitute over 48 per cent of all those convicted of criminal charges.

Relationship to the Mores: Sutherland traced the lack of stigmatization of white-collar crime to the recency of the legislation

involved and a lack of correspondence between the law and the mores. Traffic law violation presents a clear case of these conditions, recognized in the following statement by Barbara Wooton:

In half a century the invention of the internal combustion engine has completely revolutionized the business of our criminal courts. Yet this revolution is generally ignored by the public and by the professional sociologist—to a degree that really queers all criminological discussion. Apparently on the Marxian principle that law is made and operated in the interests of the well-to-do, motoring offenses generally, and infringement of speed limits in particular, are not ordinarily thought to "count" as crimes at all.

The discrepancy between the crime and the mores in the case of traffic law violations is enhanced by the fact that conviction for violations of many traffic ordinances need not involve criminal intent, or *mens rea*, on the part of the violator. This is because these ordinances are in the legal realm of *mala prohibita*, rather than *mala in se*. The distinction is one between acts which "are forbid-

den . . . by statute, but not otherwise wrong" and those done "willfully and corruptly."

* * *

It should be noted furthermore that, in these cases, the criterion for conviction is a preponderance of evidence, rather than the usual criminal criterion of guilt beyond reasonable doubt.

In fact, *mens rea* would appear to be the exception, rather than the rule, in traffic law violations. Interviews with traffic law violators in a recent project at Northwestern University—participants in almost fifty accidents—failed to reveal a single case of such intent, although many people claimed they knew the laws and admitted their violations.

Many law violations appeared to be the result of minor skill failures and perceptual errors. Respondents failed to stop at stop signs when they did not see the signs; misjudging the slickness of a roadway surface became a violation of a reasonable speed law; a poorly performed maneuver of the steering wheel became an "improper" turn; etc. The following citations from juristic discussions of traffic law violators are relevant to this point:

In these courts whose criminal jurisdiction previously covered the drunk, the tramp, the petty thief, the masher, the assaulter, and persons generally of ill repute in the community, there began to arise the victim (*sic*) of an increased tempo of life: the age of speed. . . . They were definitely not the type person who either associated with the normal non-traffic defendant or of whom it could be said that they understood only the "rod."

The attitude is generally held that the traffic violator cannot be regarded as a criminal in the usual sense of the word, even though he has broken the law. The traffic offender differs from the average criminal court defendant, both in character and with regard to state of mind.

Folk Crime: This section has suggested many parallels between traffic law violations and those law violations termed white-collar crime by Sutherland. While both are criminal according to socio-legal criteria, both are ignored or condoned by the criminological profession and by the general public. Yet

both types of violation are widespread and socially costly. The leaders of society, without thinking of themselves as criminals, participate extensively in both kinds of law violations, although violation of the traffic laws is not confined to these leaders.

It may be useful to think of both white-collar crime and traffic law violations as subspecies of folk crime.⁴ This category is proposed in order to group together violations of laws that are introduced to regulate the novel kinds of behavior that an increasingly advanced technology and an increasing division of labor generate. It should be noted, as Aubert states in connection with white-collar crime, that "the laws . . . are usually not in obvious or apparent harmony with the mores. They are largely an outcome of the increased complexity of modern industrial society, a complexity which requires legal control of activities with long-range and often very indirectly damaging effects."

The characteristics of folk crime are present in Sutherland's description of white-collar crime. However, in proposing the more general category of folk crime, these characteristics are emphasized to the exclusion of Sutherland's focus on the occupational context of the act and the white-collar status of the criminal.

The following propositions are speculatively offered concerning folk crime:

(a) Major increments to the complexity of a society, of which the automobile is a technological example, create a need for regulation where none was previously necessary.

(b) Legislation to regulate the conditions brought about by increasing complexity reclassifies certain prevalent non-criminal behavior as crime.

(c) Especially where the harmful effect of the proscribed behavior is indirect or improbable in most instances, the novel legislation may not be related to previously existing norms.

(d) Criminal behavior in folk crime is rooted, not necessarily in lower-class culture,

⁴ This term was suggested by Erwin O. Smigel, in a private communication.

but in the culture of groups most affected by the social or technological changes that the legislation attempts to control. White-collar crime is the special case of folk crime resulting from legislation regulating business and finance. The automobile, with its impact on all social classes, generates more pervasive forms of folk crime.

(e) In particular instances, large numbers of people, including those of high status, will be involved in law violations related to major social changes.

(f) The lack of congruence between the new laws and established mores, the generally higher social status of the violators, and the possibly large size of the group of violators among the total population, will tend to be associated with preferential treatment of folk criminals in the public image and in the judicial process.

* * *

In sum, the category of folk crime is proposed as a convenient way of thinking about traffic law violations, white-collar crime, chiseling, black market dealings, and many other illegal actions that have in common a source in social complexity. As opposed to "ordinary criminals," folk criminals are relatively numerous, unstigmatized, and differentially treated in the legal process. While they tend to be from higher social classes than the typical stigmatized criminal, they need not be predominantly white-collar, and the proscribed acts need not be committed in the course of business.

JUDICIAL TREATMENT OF TRAFFIC LAW VIOLATORS

The factors that distinguish traffic law violation from other crimes appear to have resulted in differential treatment for the traffic violator, in a manner analogous to the treatment of other folk crimes. Because of the large numbers of offenses committed, there has been a strain on traditional criminal procedures, resulting in new institutional forms. Because of the status of the offenders and their lack of criminal intent, there has

arisen the necessity for new kinds of sanctions. Because of the dependence of traffic law on technology, there have developed new attitudes toward the law.

New Institutional Forms: With traffic prosecutions numbering in the millions, the need for judicial processing of these offenses has exceeded the capacity of the traditional court system. Trial by jury for every case would not be possible. One response to this situation has been the development of violations bureaus to handle the less serious charges. The legal basis for the bureaucratic treatment of criminal acts is a signed plea of guilt and a waiver of trial. Standard schedules of fines are used, and payment of these penalties by mail is often permitted. The violations bureau has become a standard and integral part of the institutional machinery for handling violations of traffic laws. Three-quarters of the traffic cases in 1955 cited in the American Bar Association report were processed through violations bureaus. Not all of these were minor infractions. Forty per cent of the "moving" violations were handled in violations bureaus. Bureaucratic processing of criminal acts on a large scale in the traffic field represents an extreme of the trend to administrative treatment noted by Sutherland for white-collar crime, and constitutes a recognition of the impracticability of alternative methods of procedure. It would be extremely unlikely that a committee of the American Bar Association would recommend the use of such procedures in cases of petty theft or disorderly conduct as they do in the case of minor traffic infractions, although in a few instances, such as in the Recorder's Court in Detroit, the violations bureau has expanded to cover certain minor non-traffic offenses.

Yet the violations bureau has not solved the problem of processing millions of traffic offenses. In San Francisco, where only four per cent of the parking violations and sixteen per cent of the more serious "moving" violations are processed in court, the average traffic judge was handling 91 cases a day in 1955. A streamlining of court procedure has ac-

cordingly taken place. The jury trial is exceedingly rare in the processing of traffic violations today. The typical court for the trial of traffic charges meets in a special session for the consideration of traffic cases only. Special training is advised for the presiding judge. Cases are of necessity heard quickly. As noted above, in many instances the criterion of guilt beyond a reasonable doubt is replaced by the criterion of a preponderance of evidence for guilt.

The work of courts and violations bureaus in the attempted control of traffic infractions is aided by the technique of police "warnings" without arrests. In certain notorious situations the stopping of a motorist by a policeman has become a situation of informal trial, with a "fine" in the form of a bribe collected by the policeman. The ethics of the situation aside, large scale bribery of police functions to relieve the strains on the legitimate processing system caused by volume of cases.

New Kinds of Sanctions: Punishment of law violators in terms of fines and jail sentences is in large part dependent on the assumption of criminal intent and moral guilt to be expiated by imposed sacrifice. The traffic law violator who lacks criminal guilt often reacts to punishment for traffic law infraction as either "a cost of doing business" or an unjust penalty for something that could not possibly have been avoided. Furthermore, the concept of uniform fines for similar acts results in subjectively unequal penalties for law violators of different economic status. Associated with these facts, the prevailing trend in the field of traffic law enforcement is an attempt to educate the violator, with little intent to punish except in the most serious cases. Traffic judges try to include a lecture as a part of every conviction procedure. An increasingly popular "sentence" is to attend a traffic safety school, usually conducted by local police. Examples of more idiosyncratic attempts at education are the requirement to visit the accident ward of a hospital, suspension of a fine if a car is junked, and an enforced ten-second stop at a

frequently violated stop sign. The trend to education is experimental in the sense that its success in controlling behavior depends on the existence of an undemonstrated relationship between law violation and knowledge, and on the assumption that the proper knowledge can be imparted by these techniques.

A second trend in new kinds of sanctions is the use of a functional equivalent to incarceration in the form of license suspension and revocation. Assuming that the loss of a driver's license will keep the driver off the road, the offending behavior is eliminated while the individual keeps his freedom. The legal basis for this action is the assumption that driving is a privilege granted by the state, rather than an individual right. While this assumption has often been supported in the courts, there is reason to doubt its sociological realism, for with metropolitan decentralization many people living in suburban areas have become completely dependent on private automobile transportation. The judge or state motor vehicle bureau suspending the license of a driver runs the risk of forcing the driver into the more serious violation of licensing laws because of his dependence on his automobile for his livelihood. When, for instance, Connecticut started suspending licenses for speeding and total suspensions rose from 17,651 in 1955 to 33,075 in 1956, revocations of licenses resulting from driving while previously suspended went from zero to 1518.

New Attitudes toward the Law: While the institutional forms and kinds of sanctions noted above are important, perhaps the most interesting development in the field of traffic law enforcement is the appearance of new attitudes toward the laws. The novelty of the traffic situation has resulted in overshadowing of the charismatic and traditional bases of legitimacy for the law by rational-legal ones. It is common for laws in the traffic field to be labeled by prestigious authorities as defective and inappropriate. The main reason for this is that the technology of the automobile and the trafficways is constantly

changing. Speed laws, auto inspection laws, and financial responsibility laws of twenty years ago are already outmoded under today's conditions. Another reason may be legislative recognition of widespread violations. The American Bar Association recommends that: "Traffic laws with inherent defects should be revised and those which are unenforceable or unnecessary should be repealed." The criterion of a proper speed limit is not what was stated in the original set of traffic control enactments, but rather a quasi-scientific criterion of "safety" and "convenience." Traffic enforcement officials often express the opinion that the best law is the most efficient one, regardless of when it was put into existence or the stature of the legislator who proposed it. For example, the Automobile Club of Hartford proposes the following:

Since many studies have proved that basically, regardless of posted signs, most motorists drive at a speed they consider reasonable and prudent according to constantly changing conditions, it follows that whatever this speed may be, it should become the speed limit, and be so posted and enforced.

In line with the rational-legal bases of traffic law, and the decreased emphasis on punishment noted above, there have also been instances of legislative bodies refusing the misdemeanor classification to ordinary

traffic offenses. In New York, traffic violations are termed "traffic infractions." According to Article 1, Section 29 of the New York Vehicle and Traffic Law, "A traffic infraction is not a crime, and the penalty and punishment therefore shall not be deemed for any purpose a penal or criminal penalty or punishment." Traffic law violations in Pennsylvania are known as "summary offenses." In New Jersey they are "disorderly offenses." In neither state are these considered to be crimes, although the procedures for prosecution are identical with criminal procedures. In defining traffic law violation out of the realm of criminality, these legislators are working toward the congruence of law and the mores sought by Sutherland, but in a direction opposite to the one he implied in his writings to be desirable. Instead of working to get the criminal nature of the laws sanctioned in public opinion, they are modifying the laws to fit the present condition of opinion, which denies the criminality of traffic law violations. Assuming the desirability of congruence between law and mores, and assuming that the contribution of the criminal stigma to control of behavior is minor—both implied by Sutherland—this seems as reasonable an action as Sutherland's alternative.

* * *

This subject deserves more careful research, since Ross's analysis must be viewed as merely exploratory. Although the hypothesis is potentially important, the data comparing law violations of various occupational groups relate to it only indirectly. In addition, the records employed were of unknown reliability, and socioeconomic and other factors, including whether an accident occurred, probably influenced the police actions reported. Further, although the consistency of the data is impressive, the sample was small for statistical treatment. Moreover, since the traffic violation, as contrasted to crimes of other types, occurred in proportion to the status distributions of the population at risk, the data might be interpreted as demonstrating that factors associated with social status were of *no* consequence in their initiation. Although this does not invalidate their categorization as folk crimes, it illustrates again the difficulty (discussed in Chap. 2) of reaching specific conclusions from general data and the need for research carefully designed to answer highly specific questions.

INJURY-PRODUCING PRIVATE MOTOR VEHICLE ACCIDENTS AMONG AIRMEN

—*Joseph E. Barmack, Ph.D., Donald E. Payne, Ph.D.*

INJURY-PRODUCING PRIVATE MOTOR VEHICLE ACCIDENTS AMONG AIRMEN: PSYCHOLOGICAL MODELS OF ACCIDENT-GENERATING PROCESSES

—*Joseph E. Barmack, Ph.D., Donald E. Payne, Ph.D.*

The relationship of alcohol to traffic and other accidents illustrates well the complex interplay among cultural, social, psychological, and physiological factors in accident causation and prevention. However, although the pharmacologic effects of alcohol as an important cause of accidents have been well documented by an impressive series of laboratory experiments, controlled field studies, and epidemiologic investigations (see Chaps. 3, 4, and 5),¹¹ the factors that favor and are associated with its use have not received sufficient attention. As a result, there is not at present an adequate basis for designing and evaluating programs directed at reducing alcohol-related accidents, and it is not known whether the many current preventive measures are effective.

There are many indications that sophisticated research by behavioral scientists is urgently needed and will prove productive. For example, although it is known that the entire continuum of drinking behavior is represented in accident populations, there is already much evidence that accident-involved "drinking drivers" are *not* a statistically representative sample of all drivers who drink.¹¹⁻¹³ This was first demonstrated in 1952 by the classical work of Bjerver, Goldberg, and Linda, who found that "the heaviest [and presumably most tolerant] users [of alcohol] alone accounted for 48% of the alcohol involved accidents despite their comprising only 3.5% of the [Swedish] population at risk."¹⁴ Further, Goldberg, in related work, found additional evidence that such drivers are atypical. He reported that "the incidence of divorce was five times as high among the drunken drivers as among the whole male population, and nine times as high among the drivers convicted two or more times for drunken driving."¹⁵ Related evidence has come from the following reports by Barmack and Payne in the United States, from Smart and Schmidt in Toronto,¹⁶ from Selzer in Michigan,^{5, 12} and from McCarroll and Haddon in New York (Chap. 3), who found, for example, "that fatally injured drivers were significantly less often married, and that in the entire case-control group studied those not married had significantly higher alcohol concentrations." Additional evidence with respect to many social and other characteristics has come from the excellent work recently reported by Borkenstein *et al.* This includes the observation that under equal exposure "persons with the most education, those with better jobs, and who are middle-aged . . ." are underrepresented in accidents.¹³

It should be obvious that these gross differences between those who are involved in accidents and those who are not must be related in many complex and subtle ways to other differences between them. Many of these should prove to be of particular interest to behavioral scientists as the work of Barmack and Payne shows.

These two studies compare the social backgrounds of three groups of servicemen: (1) those who had been drinking prior to a lost-time accident in a privately owned automobile, (2) those who had not been drinking prior to a similar accident, and (3) a control group who had not been involved in an accident for at least one year. Three social factors—marital status, broken homes during childhood, and problem-drinking parents—are taken as indicators of disturbance in the individual's home life. The tables selected for reproduction below show the results of these comparisons. In general, the first study shows that members of the drinking accident group were more likely to be exposed to remote or recent disruptions of home life than either of the other two groups, a finding consistent with those of other workers, as noted above.

The second study extends the findings of the first by analyzing the results of detailed psychological interviews. On this basis it is concluded that the psychic processes involved were passive rather than active and that there was no evidence to support the hypothesis that the aim of these processes was to achieve a self-aggressive, disruptive end.

Part I describes some of the important correlates of lost time accidents to 138 Airmen in privately owned vehicles. Some comparative data on 100 controls are also provided. Drinking alcoholic beverages rather than long distance pressure driving appeared to be the primary correlate of this class of accidents. The drinking proportion is within the range of proportions of drinking among nonmilitary personnel involved in accidents, but at the upper end of the distributions. Lines of evidence in support of this view are presented.

Part II compares some biographical correlates of Airmen who were drinking prior to lost time accidents with those who were not and with those of 100 controls. The drinking was not an isolated event. The drinking accident drivers had a higher incidence of remote and recent disrupted home life and a higher involvement in disciplinary infractions.

I. THE ROLE OF DRINKING

Private motor vehicle accidents have been shown to lead all other classes of accidents as a cause of death and injury to servicemen. The consequences of private motor vehicle accidents constitute a major medical problem for the military services.

The present study was part of a program of research devoted to the development of accident countermeasures. It focused on the antecedents of personal injury accidents involving private motor vehicles driven by

Airmen. The study was restricted to personal injury accidents on the assumptions that this class was different from the property damage type and that the inclusion of large numbers of the latter might well obscure any distinctive characteristics of injury-producing accident drivers.

Although the use of control groups is rare in field investigations of accident phenomena, they are important in clarifying data trends. Consequently, this study was designed to permit certain comparisons of a sample of accident drivers and a sample of non-accident control drivers.

Early in the study drinking was found to be a frequent precursor of personal injury accidents. Accordingly, investigation was directed to an appraisal of the role of drinking in private motor vehicle accidents and to an analysis of factors which attend drinking-driving accidents. The role of drinking is discussed in this article; factors in the personal histories of drivers involved in accidents preceded by drinking are discussed in Part II.

The subjects of this study were Airmen. Personnel from other services were excluded for two reasons: (1) the exploratory phase of this study began with Airmen—expansion of the research to include members of the other

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services was planned; and (2) with a limited number of subjects, homogeneity with respect to branch of service seemed desirable to avoid problems of fractionating the samples into ones which would make a statistical treatment of the data impractical.

Although the subjects are servicemen, the problem of the drinking driver is not limited to the services. A digest of representative studies on the incidence of pre-accident drinking is presented in Table 1 [omitted].

Table 1 reveals that the incidence of pre-accident drinking reported in various studies ranged from 1.3 percent to 69.9 percent. Some of this variability probably can be accounted for on the basis of differing degrees of leniency in the criterion of drinking, differing lengths of time between accident and blood test, and by inevitable random fluctuations due to small sample sizes. Also, as Plymat has pointed out, the validity of reports of extremely low preaccident drinking percentages are often questionable. On the other hand, although the magnitude of the drinking-driver involvement in accidents may have been underestimated generally in the past, there is reason to believe that the significance of the problem is gaining recognition.

METHOD

The Accident Sample: The accident population was defined as all Airmen who, while driving a privately-owned motor vehicle, were involved in an accident which resulted in a lost-time injury to the driver or to a military passenger. To secure a reasonably large sample of accident drivers, 14 Air Force Bases were visited.

During the period of the study (January 1, 1958 to June 30, 1959), a total of 239 drivers at these bases were involved in this kind of accident. Of these, 155 (64.9 percent) were interviewed. Seventeen of the interviewed subjects had been riding motor scooters or motor cycles. This number was too small for a separate analysis, and was omitted. Consequently, the final sample of the study comprised 138 interviewed drivers.

Since 35.1 percent of the accident population was not interviewed, the possibility of a biased sample had to be considered. To identify possible sources of bias arising in the selection of cases for interview, the reason for the unavailability of each case was determined and a copy of the official accident report (the AF Form 122 Report) for each was also obtained.

Of the un interviewed cases, the most frequent reason for unavailability was a permanent change of station (28.6 percent of the cases). Death was the next most frequent reason (19 percent). Other reasons included confinement in a remote hospital, discharge, leave, and on the hospital critical list. These events could occur because the average interval between the accident and the interview was 2.4 months.

A comparison of selected data from the official accident reports of the interviewed and un interviewed is shown in Table 2.

TABLE 2.—COMPARISON OF INTERVIEWED AND UNINTERVIEWED ACCIDENT DRIVERS

Characteristic	Interviewed (N = 138)	Noninterviewed (N = 84)
Age (median)	23.5 years	22.3 years
Rank (model)	Airman	Airman
	Second Class	Second Class
Drinking noted (% of cases)	44.7	52.4
Driver judged responsible, %	84.1	83.8
Multiple vehicle accident, %	42.7	40.3

Note: None of the differences was statistically significant. Data from AF Form 122.

The differences are small and not significant statistically. The data permit a rejection of the hypothesis that the procedure for getting to the cases filtered out the "worst" ones to be interviewed. If any bias was operating, it was in the direction of understating the drinking involvement in the sample.

The Control Sample: To assure randomness the control sample was selected from Air Force personnel whose serial numbers ended in an arbitrarily chosen double number. These numbers were different for each base (for example, xxx-xxx-x22 at one base, xxx-xxx-x33 at another, etc.). From these

groups, individuals were chosen who possessed a currently valid driver's license, and who had had no traffic accidents for one year or longer. Of the total number of persons who met these criteria, 40 percent were interviewed. The remainder were unavailable because of leaves, inaccessibility of duty site, high priority duty, and other reasons. The census characteristics of the final interviewed group matched fairly closely the Air Force as a whole, except that the officer population was under-represented. Few of the accident drivers were officers; therefore, the controls were chosen to match the distribution of Air Force personnel in the enlisted grades.

The definition of a control for an accident group poses some difficult problems. The properties of a control group should be dependent on the types of questions addressed to the data. Consequently, no single group can effectively serve as a universal control when the questions asked are varied, as they must be in an exploratory study. The members of the control group selected by this method were older by $2\frac{1}{2}$ years than the members of the accident group, fewer were driving borrowed cars, their cars were older, and had more mileage on them. Although there was no significant difference in the number of miles driven in the last year, the trend suggested a somewhat higher exposure in the accident group. Other differences are discussed in the results but in substance there is no clear evidence that the procedure for selecting the control group singled out the individuals with especially low exposure characteristics.

Correlated with this difference in age are differences in marital status, which in turn relate to the availability of funds for new cars. Finally it should be noted that the accident sample in this study was not selected on the basis of accident repetition, but rather on the basis of a single injury-producing accident which occurred during a given span of time. Similarly, the control sample was not selected because its members were completely accident free, but rather because they were free from property damage or per-

sonal injury accidents for a year. Accident repeaters and accident-free individuals are useful in studying accident proneness. However, a study designed to find the causes of personal injury accidents must sample all cases as they occur without excluding the non-repeaters.

The Interview Procedure: The primary data collection procedure was a semistructured personal interview. The close cooperation of Air Force personnel throughout the study, and their respect for the interview data as privileged communication, greatly facilitated the conduct of this study.

Each interview required from two to four hours, and covered: family background, schooling and employment, military service, marital status, future career plans, car ownership, driving and accident history, opinions about accident causation and prevention, recreational activities, drinking practices, and the events of the 48 hours preceding the accident.

Interviews with control subjects covered similar areas except for the events surrounding the accident. In place of a description of the accident, controls were asked to describe in detail their driving (and drinking) activities during the seven days immediately preceding the interview.

The first step in the interview procedure was to explain the nature and purpose of the research program to the subject. He was assured that his communications would be privileged and advised that he could feel free to decline to answer any questions, but was urged to answer frankly. Interviewer bias was minimized by the careful delineation of criteria for categorizing responses and by the use of six interviewers.

* * *

SUMMARY

An interview study of 138 drivers involved in injury producing accidents and 100 control drivers drawn from a random sample of Airmen revealed:

1. Preaccident drinking occurred in roughly two-thirds (64.5 percent) of the sample

of accidents. This figure was at the upper end of the distribution of percentages reported for civilian accident drivers, but consistent with another study of preaccident drinking among military personnel.

2. Official accident reports underestimated the incidence of preaccident drinking.

3. The total number of accidents and the total number of drinking-driver accidents were greater on weekends than on weekdays. However, the percentage of drinking-driver accidents was fairly consistent from day to day.

4. Total driving exposure among the controls was only slightly higher on weekends than on weekdays, but their drinking-driving exposure, though small, trebled on weekends.

5. Drinking-driving accounted for no more than 5.3 percent of the total driving of the control subjects. Accordingly the incidence of drinking-driving among the accident group was twelve times that of the controls.

6. Nondrinking accidents were associated with traffic density, and tended to occur most often during the morning and afternoon "rush" hours.

7. Drinking accidents were primarily night accidents, 83.1 percent occurring between 6 PM and 6 AM.

8. Drinking was associated with single-vehicle accidents.

9. Drinking and nondrinking accidents tended to be local (occur in the vicinity of the base) and occur during short-distance trips. Very few accidents could be attributed to long-distance driving and fatigue.

10. Cooperation of military and civilian personnel for the development and testing of programs to carry surveillance of the drinking driver beyond the base gates seems highly desirable for effective reduction of drinking accidents. A number of promising countermeasures were suggested for evaluation.

II. BACKGROUND CORRELATES OF THE LOST-TIME ACCIDENT

Because preaccident drinking was so prominent a characteristic of the class of acci-

dents studied, it is important to know something about the role of drinking in the lives of the accident victims if effective preventive measures are to be developed. Preventive measures for reducing drinking-driver accidents could be designed to persuade individuals to avoid the combination of drinking and driving. The form of persuasion would depend on whether the bulk of the drinking accident drivers are social drinkers as suggested by Kearney or compulsive drinkers as Popham has proposed. Rational appeals may have some influence on social drinkers but little or no influence on compulsive drinkers.

However, there are several complications to the apparently simple distinction between the social drinker and the compulsive drinker. Drinking habits do not fit into discrete categories, rather they occupy a broad spectrum of which some of the crucial variables are time, frequency, amount, control, and health and social effects.

Bjerver, Goldberg and Linda, and Gold-berg utilized a Swedish system which includes three levels of problem drinkers: (a) addicts—persons confined to institutions for alcoholics (under Article 1 of the Swedish Alcohol Law) at any time during the three years preceding the study; (b) abusers—persons with three or more convictions for offenses involving drinking; and (c) excessive drinkers—persons with one or two convictions involving drinking. Bjerver, et al. found a 32.5 percent incidence of all three classes of problem drinkers in a male accident-injured population; among those victims whose blood tests were positive for alcohol at the time of hospital admission, 69.5 percent were problem drinkers, though only 8.7 percent qualified as addicts.

The drinking habits of a military population, of course, might be expected to differ from those of a civilian one as a result of selection. Overt alcoholics are not accepted by the Armed Forces if their condition is known; if it is discovered subsequent to induction, they are likely to be separated from the service soon after.

Another important issue affecting the development of accident countermeasures is the

degree of relationship between accidents and psychopathology. The accident driver is not usually thought of as mentally ill, though the accident repeater may be. Canty, for instance, reported that only 9.7 percent of the traffic violation repeaters seen in his clinic were free of major psychopathy. On the other hand, this estimate cannot be applied to accident repeaters in general (much less to the non-repeater accident driver) since the cases seen in the clinic had all been referred by state and municipal judges and officials who presumably had reason to question the mental health of the offenders.

Most studies suggest that accident repetition reflects a pattern of inadequate adjustment which does not readily fit into existing psychiatric diagnostic categories. The accident repeater has been described as the product of a broken home, socially immature and impulsively resentful toward authority, with escapist and/or self-destructive tendencies. Of course, the primary focus of the present investigation was not on repeaters. It was desired to determine whether the characteristics of repeaters, as cited in the literature, could be confirmed on a representative sample of airmen involved in lost-time accidents in privately owned vehicles. The nature of the adjustment problems and their accessibility to psychiatric treatment are important in assessing the feasibility of countermeasures which would involve psychiatric assistance.

METHOD

The details of procedure were described in Part I. The essential feature of the procedure was an intensive semistructured interview of

two to four hours' duration. Three groups of drivers were involved:

1. A drinking accident group, consisting of 89 drivers (Airmen) involved in private automobile accidents which resulted in lost-time injuries to themselves or to their passengers. They reported having had at least two alcoholic beverages within four hours of the accident.

2. A not-drinking accident group consisting of 49 drivers involved in lost-time accidents, but who reported they had not been drinking, or at most had a single alcoholic drink within four hours of the accident.

3. A control group, consisting of 100 randomly selected drivers who had not been involved in a lost-time or property damage accident within one year of the interview.

RESULTS

A comparison of the motor vehicle accident histories of the three groups with and without the current accident included is shown in Table 7, which indicates that the accident and control groups were strikingly similar in frequency of accidents before the present one. Of course, inclusion of the current accident markedly changed the distribution. With the present accident included, 52.8 percent of the drinking accident group had two or more accidents, as opposed to 53.0 percent of the not-drinking group, and 20.0 percent of the controls. While the number of repeaters was enlarged, still only half of the accident drivers could be categorized as repeaters. In other words, on the basis of past accident experience, there was no difference between the group who became involved

TABLE 7.—ACCIDENT HISTORY BEFORE AND INCLUDING CURRENT ACCIDENT

Number of accidents	ACCIDENT DRIVERS				
	DRINKING (N = 89)		NOT DRINKING (N = 49)		CONTROL DRIVERS (N = 100)
	Present accident excluded %	Present accident included %	Present accident excluded %	Present accident included %	Any past accident experience %
0	47.2	0.0	46.9	0.0	44.0
1	31.4	47.2	30.6	46.9	36.0
2	14.6	31.4	16.3	30.6	12.0
3	3.4	14.6	6.1	16.3	4.0
4 or more	3.4	6.8	0.0	6.1	4.0
Average per man	0.92	1.92	0.82	1.82	0.92

in accidents and the control group who remained accident free for at least one year.

The usual drinking habits of the three groups were compared to determine whether the drinking of the drinking accident sample was an isolated event or part of a recurring pattern. The data are shown in Table 8, and indicate that the distributions of frequency of drinking for the not-drinking accident sample and the control sample resembled each other closely, but that the distribution of the drinking accident group was markedly different from the other two ($p = 0.001$).

TABLE 8.—REPORTED FREQUENCY OF DRINKING AMONG ACCIDENT AND CONTROL DRIVERS

Frequency of drinking	ACCIDENT DRIVERS		CONTROL DRIVERS (N = 100)
	Drinking prior to accident (N = 58) ¹	Not drinking prior to accident (N = 36) ¹	
	%	%	%
More than once a week	72.4	36.1	44.0
Once a week—once a month	25.9	30.6	21.0
Once a month—once a year	1.7	13.9	17.0
Not at all	0.0	19.4	18.0
Total	100.0	100.0	100.0

¹ Because this line of inquiry was not begun until the study was well under way, this information is reported on two-thirds of the accident cases but on all of the controls.

The practical significance of the higher frequency of drinking among the drinking accident group is attenuated somewhat by the fact that if one asked individuals selected at random about their drinking habits, and separated them into two groups: (a) those who had been drinking on a recent, randomly selected date, and (b) all others, the drinking frequency distributions would also differ. The "dated" group would be devoid of the 18-19 percent who do not drink at all. Nevertheless, even taking this fact into account, the distribution of the drinking accident group was still skewed toward the high frequency end. The data demonstrate that drinking at the time of the accident was not an isolated or chance event but rather that this type of accident included a high proportion of regular drinkers.

The fact that more members of the drinking accident sample were likely to drink more frequently does not mean they were alcoholic.

In order to quantify the extent to which drinking was a problem the categories and criteria reported by Goldberg were used. Table 9 presents the incidence of problem drinkers in the accident and control samples and indicates that the problem drinkers were very significantly over-represented in the drinking accident driver group. Although the drinking accident group had a significantly higher percentage of problem drink-

TABLE 9.—INCIDENCE OF PROBLEM DRINKERS AMONG THE ACCIDENT AND CONTROL DRIVERS

Problem drinking habits	ACCIDENT DRIVERS		CONTROL DRIVERS (N = 100)
	Drinking (N = 89)	Not drinking (N = 49)	
	%	%	%
Addict	0.0	0.0	0.0
Abuser	11.2	2.0	1.0
Excessive	22.5	8.2	8.0
Subtotals			
Problem drinkers ¹	33.7	10.2	9.0
No drinking problem	66.3	89.8	91.0
Total	100.0	100.0	100.0

¹ Incidence of problem drinkers among drinking accident drivers significantly higher than among not drinking accident drivers (CR = 3.1, $p = 0.002$), or controls (CR = 4.2, $p = 0.0001$).

ers, the hypothesis of Popham that "... traffic accidents involving drivers who had been drinking are to a considerable extent a problem of alcoholism rather than largely a problem of the effects of alcohol on the casual drinker" was not completely confirmed. There were no addicts in any of the groups, and the proportion of problem drinkers did not constitute a majority even among the drinking accident drivers.

Adjustment Problems: No psychiatric diagnostic examination was obtained for any of the interviewees, consequently their current psychiatric status cannot be described definitively. However, there was no case of a diagnosed psychotic episode requiring hospitalization reported in the biographical data of any of the three groups. Although it cannot be concluded with confidence that there was

none, it is clear that psychosis was not a noteworthy biographical characteristic of the accident groups.

There was evidence, however, that the drinking accident tended to select those persons who had early family environments identified as emotionally traumatic. Table 10 compares the incidence of early family trauma among the three groups. The most striking finding is the lack of homogeneity among the two accident groups. (The difference in incidence of trauma between them was 23.0 percent, $CR = 2.7$, $p = 0.02$.) This differ-

TABLE 10.—INCIDENCE OF EARLY FAMILY TRAUMA¹ AMONG ACCIDENT AND CONTROL DRIVERS

Family background	ACCIDENT DRIVERS		CONTROL DRIVERS
	Drinking (N = 89)	Not drinking (N = 49)	(N = 100)
	%	%	%
Traumatic	39.3	16.3	28.0
Nontraumatic	60.7	83.7	72.0
Total	100.0	100.0	100.0

Note: Chi square = 8.19, $df = 2$, $p = 0.02$. This value permits rejection of the hypothesis that the two accident groups and controls have the same distribution of family backgrounds.

¹ The traumatic category includes those who were separated from one or both parents before age 13 for reasons of parental death, desertion, separation, divorce, imprisonment, or commitment to a mental hospital. Also included were those who were separated and were raised by others for at least six months while both parents were still alive. The nontraumatic category includes all others. It is not implied that the members of the nontraumatic group were free from emotional trauma, but rather that they did not meet certain criteria of trauma. The particular criteria were selected because they could be clearly identified in biographical data.

ence remained fairly stable from the first few cases throughout the collection of the entire sample.

In view of the studies by Tillmann, Schulzinger and others associating accident repetition with a history of a broken home, the question may be raised as to how much this association owes to the intervention of alcohol as a palliative for the feelings of loneliness, rejection, resentment, etc., generated by the broken home experience.

Table 10 also shows that while an incidence of 39.3 percent broken homes seems high it is only 11.3 percent higher than that of the control group ($CR = 1.7$, $p = 0.09$) and 14.5 percent higher than the figure (24.8 percent)

reported by Ryan for 2,262 unselected Army recruits. Accordingly, this characteristic is meaningfully and differentially associated with a relatively small subgroup of the drinking accident sample.

There is evidence that some of the criteria of trauma are more heavily associated than others with the drinking accident. One quarter of the 35 drinking drivers who came from broken homes had been exposed to socially stigmatized parental separations (for example, felony conviction of parent, suicide, hospitalization of parent for mental illness, or desertion). Only one of the eight not-drinking accident drivers from broken homes and one of the 28 controls from broken homes had experienced socially stigmatized separations. The number of cases involved is small, however, and the differences not statistically significant.

Another clue to the quality of the home life of a substantial proportion of the drinking drivers is provided by the incidence of problem drinking among the drivers' parents. A problem drinking parent was defined as one who drank heavily to a point impairing health or job stability and resulting in medical advice to stop, and/or quarreling with the other parent about stopping drinking. The data in Table 11 suggest that one thread in the etiology of this type of accident may be that the drinking accident driver has acquired, through parental example in some cases, the mode of using alcohol to deal with tension or other unpleasant feelings. Still another explanation might be that a problem drinking parent generates a variety of family disturbances of which drinking by the offspring may be one expression.

The data on parental characteristics (Tables 10 and 11) do not prove that the three groups of offspring are different in their ability to cope or to adjust. They merely indicate that the drinking accident population is moderately over-represented with individuals who had more to cope with as children. As Ryan has shown, this circumstance does not necessarily impair coping ability. In his study, the vast majority (88.5 percent) of the men who came from broken homes were ef-

TABLE 11.—INCIDENCE OF PROBLEM DRINKERS AMONG THE PARENTS OF THE ACCIDENT AND CONTROL DRIVERS

	ACCIDENT DRIVERS		CONTROL DRIVERS (N = 100)
	Drinking prior to accident (N = 89) %	Not drinking prior to accident (N = 49) %	
<i>Parental drinking</i>			
Father a problem drinker	21.3	14.3	9.0
Mother a problem drinker	1.1	0.0	0.0
Both problem drinkers	7.9	2.0	1.0
Total ¹	30.3	16.3	10.0

¹ Incidence of problem drinkers among parents of drinking accident drivers is significantly higher than their incidence among the parents of the not-drinking accident drivers ($p = 0.05$) or the controls ($p = 0.0001$).

fective in the service. However, the remaining 11.5 percent contributed disproportionately to the usual criteria of non-effectiveness (involvement in company punishment, courts martial and civil difficulties). To these criteria might be added on the basis of this study, the drinking, lost-time accident.

There is evidence that the accident groups (and the drinking accident particularly) were selective of individuals with no immediate home ties. Table 12 compares the marital status of the three groups. Nearly three quarters (74.2 percent) of the drinking accident drivers and 61.2 percent of the not-drinking drivers were living alone as compared with 42 percent of the controls. The difference between the accident groups was not statistically significant, but the difference between the drinking accident group and the control was significant (at the 0.001 level) as was that between the not-drinking group and the control (at the 0.03 level).

One may assume that Airmen who are living alone are more likely to spend leisure time drinking and bar or party hopping; they become more vulnerable to accidents as a consequence.

It could be postulated that the differences in incidence of living alone are an adventitious function of the age differences of the three groups. The average age in years of the drinking accident sample was 23.7; of the not-drinking accident sample, 23.1; and of

the controls, 26.1. These age differences occur in a period during which many young men marry. However, single status, regardless of its relationship to age, could contribute more directly to accidents than other correlates of age by virtue of the social factors mentioned previously. Support for this view is found among the reports of some of the married controls who cited a relatively high frequency of drinking and driving before marriage, followed by a "settling down" in which this pattern either diminished or disappeared entirely.

Table 12 also shows a surprising difference between the drinking accident sample and the controls in their proportions of married Airmen living apart from their wives, 22.5 percent vs 8.0 percent. The difference is more striking than shown since the percentages do not take into account the different proportions of married individuals in the two populations. When this is done it is clear that 46.6 percent, or almost one half the married men in the drinking accident group, and 29.5 percent of the non-drinking accident group are not living with their wives as compared with 12.1 percent of the married controls.

The small number of cases among the married men not living with their wives prohibits statistical comparisons of the reasons for living apart. "Economic" reasons were most

TABLE 12.—MARITAL STATUS OF ACCIDENT AND CONTROL DRIVERS

	ACCIDENT DRIVERS		CONTROL DRIVERS (N = 100)
	Drinking prior to accident (N = 89) %	Not drinking prior to accident (N = 49) %	
<i>Marital status</i>			
Single ¹	51.7	44.9	34.0
Married:			
living apart ²	22.5	16.3	8.0
Subtotal:			
living alone ³	74.2	61.2	42.0
Married:			
living together	25.8	38.8	58.0
Total	100.0	100.0	100.0

¹ Difference between accident groups not significant, but drinking accident group significantly different from controls ($p = 0.02$).

² Difference between accident groups not significant, but drinking accident group significantly different from controls ($p = 0.01$).

³ Difference between accident groups not significant, but drinking accident group significantly different from controls ($p = 0.001$).

frequently cited by all three groups, but marital conflict turned up proportionately more frequently among the drinking accident group.

These data lend support to the view that the drinking accident may be selective of individuals with a current marital adjustment problem; however, additional data are needed. It would be desirable to match the drinking accident group with a control group having the same age distribution and the same proportion of married men, and explore more intensively the nature of the marital adjustments of the two groups.

If "living apart" is used as a coarse index of marital adjustment, it is appropriate to ask whether early traumatic family experiences contribute disproportionately to marital problems. Although the numbers involved are small, the trend for all three groups is that those with early family traumatic backgrounds are over-represented in the samples of married men living apart from their wives. The percentage of drivers who were married but currently living alone and who reported broken childhood homes was higher among the drinking accident drivers (35.0 percent) than among the not-drinking accident group (14.3 percent) or the controls (0.0 percent). Because of the small number of cases involved, the differences were not statistically significant. If these trends are confirmed, it would appear that the drinking accident population is selective of different subpopulations who are drinking in response to recent as well as remote sources of unhappiness.

Until confirmatory information is available, the most conservative inference to be drawn from the present data is that the drinking accident group draws most heavily from a population without immediate or local home ties. These are the individuals who are most likely to spend part of their leisure in varying combinations of drinking and driving. In this way they are most likely to become involved in an accident.

Still another area in which adjustment problems might be reflected is in relation to authority. Are the groups different in their prior experiences of nonconformity? To an-

TABLE 13.—DISCIPLINARY HISTORY:
ALL INFRACTIONS¹

Disciplinary history	ACCIDENT DRIVERS		CONTROL DRIVERS (N = 100)
	Drinking prior to accident (N = 89) %	Not drinking prior to accident (N = 49) %	
Reported one or more infractions ²	87.6	73.5	50.0
Reported no infractions	12.4	26.5	50.0
Total	100.0	100.0	100.0

¹ Includes civil jail incarceration, moving vehicle violation, article 15, and/or court martial. Disciplinary actions resulting from the present accident were not included.

² Percentage of drinking accident drivers who committed infractions significantly higher than percentage among: not-drinking accident drivers (CR = 2.1, $p = 0.04$) or controls (CR = 5.5, $p = 0.0001$). Similarly, the not-drinking accident group had a higher proportion of offenders than the controls (CR = 2.7, $p = 0.007$).

wer this question, the groups were compared with reference to preaccident civil jail incarcerations, motor vehicle (moving) violations, minor military infractions (Article 15), and major military infractions (courts martial). The results are presented in Table 13.

With few exceptions group differences were not significant for any single class of infractions. However, the general trend was consistent. For each class of infractions, the drinking driver accident group exhibited: (a) a greater percentage of persons who had committed the infraction than either the not-drinking accident group or the controls; and (b) a higher number of infractions per man than either of the other groups. The not-drinking driver accident group was generally equal to, or only slightly more often involved than the control group. Consequently, if authority conflict is not limited to specific classes of infractions, but rather is assumed to be reflected in all kinds of infractions, then it is the total disciplinary history that is relevant.

DISCUSSION

There are two characteristics of this study which suggest caution in accepting the findings:

1. Although the present investigation utilized more case histories, obtained by lengthy

qualitative interviews, than is characteristic of studies in the accident field, the numbers involved by other standards are small.

2. This report presents only a portion of the information collected. Findings have been selected which appear relevant to the drinking-accident problem. Most of these findings are statistically significant. However, through selection from a mass of data it is possible to be misled into assuming that all statistically significant findings are replicable. This may not be true.

For these reasons this study needs to be followed up. It is believed desirable that further studies include personnel from the other two services as well.

It should be noted that this sample of accident cases does not represent all types of automobile accidents, but rather a specific class of accidents having special properties of medical interest—injuries to Airmen, resulting in loss of duty time for 24 hours or more as a result of privately-owned vehicle accidents. Accidents with these properties "select" individuals with certain other characteristics. This group is at least occupationally different from Airmen having accidents in government-owned vehicles. It has been shown that if single-vehicle accidents had been studied, there would have been a higher proportion of drinking-accidents, etc. What has been described in quantitative terms are some of the accident-correlated properties of a group which this class of accidents selects.

It is clear that the group is more heterogeneous than homogeneous.

The findings of this study are consistent with results reported by Tillmann and Canty, both of whom have stressed the social difficulties of the chronic offender. The social difficulties seem to characterize not only the chronic offender, but a disproportion of all personal injury accident drivers.

There are other important implications from the findings of the present study. The data suggest that some part, or all, of the relationship between biographical data or personality measures and accidents reported in other studies owes its existence to drinking

as an intervening variable. The validity and importance of previously reported findings are not in question. Rather, the position is taken that, if the nature of the processes that lead to accidents is to be understood, it is important to clarify the inter-relations between psychic trauma, drinking, and accidents.

There are at least three possibilities:

1. The accident is in some way related to some personality trait or psychic trauma. Drinking is incidental to the accident though it may also be a consequence of the psychic trauma.

2. The accident is an outcome of heavy drinking. The drinking is used as a palliative for the psychic trauma.

3. The accident is selective of those who for reasons of trauma are sensitized to behave maladaptively behind a wheel even with a moderate amount of alcohol.

Admittedly, information on preaccident drinking is difficult to obtain. Nevertheless, it is important for future research on the relationship between personality and accidents to give particular attention to obtaining valid drinking data to avoid contaminating the properties of drinkers with other properties of those involved in accidents.

One other finding which is particularly important for countermeasure development is that problem drinking is more common among drivers who were drinking before the accident than among controls or among those who were not drinking at the time of the accident. There is a disproportionately high incidence of early and recent disruptions of home life among them. These facts suggest that this group has a greater dependency on drinking, perhaps as a tranquilizer. The dependency suggests, in turn, that logical appeals to dissuade drinkers from driving, or vice versa, would have limited value. Other approaches are indicated. Those which involve surveillance and punitive action have already been discussed in Part I. The findings in this study would suggest that some form of psychiatric assistance might be useful.

Consideration has been given recently to

the prospect of treating alcoholism in the services as an illness, that is, medically rather than as a crime to be dealt with punitively. If this change were to come about, one of the adventitious consequences might be a reduction in lost-time automobile accidents.

Another approach might be to use group therapy among drivers to reduce tensions which lead to drinking. Any mass approach of this kind, although it might be justified on the grounds of morale or efficiency, would require more convincing evidence than is currently available that it reduces accidents. Research on group psychotherapy with chronic offenders, currently being conducted by Tillmann, may provide leads on the value of this approach.

Because of the scarcity of adequately trained psychiatrists, any approach using psychiatric personnel must be highly selective. Perhaps such selectivity could be achieved if psychiatric screening (and therapy, if indicated) were applied only to drivers of vehicles involved in injury producing accidents. However, the data indicate that roughly three-quarters (73.3 percent) of these accidents are the driver's first since entering the service. Assuming that each driver would receive psychiatric attention at the time of his first accident after entering the service, and assuming further that this attention completely prevented any future accidents among these drivers, it would at most reduce lost-time accidents by only 26.7 percent.

These facts suggest that efficiency and economy of psychiatric intervention can be obtained only if the military psychiatrist functions in a nontraditional role. With this in mind, the authors devised a psychiatrically oriented countermeasure which involved the psychiatrist both in the conventional role of diagnostician and therapist and as a group behavior modifier. The latter was attempted through an educational program to undercut the social tolerance and even support that young men give each other in relation to drinking and speeding. This countermeasure was put into operation at

Lackland AFB for a year for experimental evaluation. The results of the experiment are described elsewhere.

SUMMARY

This study compares some background correlates of the three groups of Airmen: (a) 89 drivers who had been drinking prior to a lost-time accident in a privately owned automobile, (b) 49 drivers who had not been drinking prior to a similar accident, and (c) 100 driver controls who had not been involved in an accident for at least a year.

1. There were no significant differences in the accident histories of the three groups prior to the current accident.

2. Drinking at the time of the accident was not an isolated event. (a) The percentage of those who drank more than once a week was significantly higher among the drinking accident drivers than among the not-drinking accident drivers or the controls. (b) The percentage of problem drinkers, using Goldberg's criteria of problem drinking, was significantly higher among the drinking accident drivers than among the not-drinking accident drivers or the controls.

3. None of the Airmen in any of the groups reported ever having been hospitalized for psychiatric reasons.

4. Members of the drinking accident group were more likely to be exposed to remote and/or recent disruptions of home life than either of the other groups. (a) The drinking accident group had a significantly higher incidence of broken homes in childhood than the not-drinking group. Drinking may be an important intervening variable in the relationship reported in the literature between accidents and childhood psychic trauma. (b) The drinking accident group had a significantly higher incidence of problem drinking parents than the other groups. (c) The drinking accident group contained a higher percentage of married Airmen living apart. (d) The drinking accident group contained a significantly higher percentage of single persons than the controls.

5. Both accident groups had a significant-

ly higher incidence of involvement in disciplinary infractions than the controls.

6. Problems and prospects in the develop-

ment of psychiatrically oriented methods for preventing accidents which involve problem drinkers were discussed.

* * *

In two previous reports the authors presented descriptive data on a representative sample of 138 airmen drivers involved in injury-producing accidents in privately owned automobiles. The data were obtained from lengthy interviews with the drivers and from accident report forms (AF Form 122) provided by Air Force accident investigators. Comparative data were obtained on 100 airmen controls selected to be representative of airmen drivers not involved in an automobile accident for at least one year.

Of the accident drivers, 64.5 per cent reported they had been drinking prior to the accident. The drinking accident group contained a larger proportion of frequent and problem drinkers and had a higher incidence of remote and recently disrupted home lives than the not-drinking accident drivers and the controls. However, there was so much overlap among the groups that no outstanding group differences emerged. This report presents additional analyses of group differences which have implications for explanation of accident causation.

* * *

Marital Status: We have reported previously that the drinking-driver accident sample was overrepresented with airmen who were from broken homes or who were living apart from their wives. The not-drinking accident sample was, if anything, underrepresented in this respect (in comparison with a control group).

In a subsequent analysis in which the type of accident (single- versus multiple-vehicle) was used to fractionate the data, some additional relationships became apparent. These data are presented in Table 4.

TABLE 4.—MARITAL STATUS OF DRIVER AND TYPE OF ACCIDENT
VEHICULAR INVOLVEMENT

	Single-vehicle (N = 77)	Multiple-vehicle (N = 61)
Marital status	%	%
Married	40.2	65.6
Single	59.8	34.4
Total	100.0	100.0

Note.— $\chi^2 = 7.74$, $df = 1$, $p = .005$. This value of χ^2 supports the hypothesis that there is an association between marital status and type of accident.

For this sample the single-vehicle accident seems to be primarily a single airman's ailment, and the multiple-vehicle accident seems to be a married airman's ailment. This rather odd coincidence may be understandable in terms of the sociology of exposure of the two groups. There is likely to be a higher proportion of preaccident drinking, including bar and party hopping, among the unmarried as compared with married airmen. The married airman's driving may be limited to residential, urban areas, whereas the unmarried airman's driving may cover interurban as well as urban areas.

Family background: The relationship between family background and type of accident is presented in Table 5.

Table 5 shows that the highest incidence of home disruption occurred among airmen

TABLE 5.—HOME DISRUPTION AND TYPE OF ACCIDENT

Group	SINGLE VEHICLE		MULTIPLE VEHICLE	
	Drink- ing (N=59)	Not- drinking (N=18)	Drink- ing (N=30)	Not- drinking (N=31)
Home disrupted	47.4	27.7	66.7	29.0
Home not disrupted	52.6	72.3	33.3	71.0
Total	100.0	100.0	100.0	100.0

A χ^2 test applied to the drinking and not-drinking groups (i.e., ignoring type of accident) resulted in the following: $\chi^2 = 7.22$, $df = 1$, $p = .01$. This value of χ^2 supports the hypothesis that there is an association between family background and preaccident drinking.

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in the drinking-driver, multiple-vehicle accident. Both drinking-driver groups are clearly different from the not-drinking ones in incidence of home disruption. However, the proportion of home disruption in the drinking-driver, single-vehicle accident category is proportionately small because of a high concentration of unmarried individuals from non-disrupted homes.

Table 6 compares the proportions of unmarried airmen from non-disrupted homes among the four accident categories.

The drinking driver involved in a single-vehicle accident appears to be drawn from either one of two different populations:

1. The home disrupted population.
2. The home non-disrupted, but unmarried population.

The role of drinking in the two groups may be quite different. In the home-disrupted group, drinking may serve as a tranquilizer—a relief from psychic pain generated by the disruption. For the unmarried group the drinking may serve the purposes of reality testing, demonstration of masculinity, socializing, etc. These hypotheses warrant investigation in future research.

In the foregoing we have shown that when our sample of accident drivers is grouped according to whether they were involved in single-vehicle or multiple-vehicle accidents and whether the accident was or was not preceded by drinking, greater homogeneity is achieved in a number of correlated properties. In the following section we will consider some hypotheses about intervening processes in these categories of accidents.

PREACCIDENT PROCESSES

Active versus Passive Psychological Processes: The drinking-driver, single-vehicle accident, associated with speeding, disrupted homes, unmarried airmen, etc., may suggest accident generating processes in the nature of *active*, symbolic, self-destructive acts released by alcohol. Our data, however, do not support this hypothesis. Rather they suggest that most (indeed not all) of these accidents were an end product of passive, not active psychological processes. Further-

TABLE 6.—UNMARRIED AIRMEN FROM NON-DISRUPTED HOMES

Group	SINGLE VEHICLE		MULTIPLE VEHICLE	
	Drink- ing (N=59)	Not- drinking (N=18)	Drink- ing (N=30)	Not- drinking (N=31)
	%	%	%	%
Unmarried airmen from non-disrupted homes	40.7	55.5	13.3	25.8
All others	59.3	44.5	86.7	74.2
Total	100.0	100.0	100.0	100.0

Note.—The proportion of unmarried airmen from non-disrupted homes among the drinking drivers involved in multiple-vehicle accidents was significantly lower than among the single-vehicle-accident drivers, whether drinking ($CR = 2.6$, $p = .01$) or not-drinking ($CR = 3.1$, $p = .003$). The proportion of unmarried airmen from non-disrupted homes among the not-drinking drivers involved in multiple-vehicle accidents was significantly lower than among the not-drinking drivers involved in single-vehicle accidents ($CR = 2.1$, $p = .03$). None of the other differences was significant.

more, the intent was not necessarily self-destructive. The evidence for this position follows:

Impaired Consciousness: A content analysis was made of the interview protocols to identify perceptual, cognitive, motor, and emotional factors which appeared in the description of the accident events.

Those factors which reflect impaired or maladaptive characteristics of consciousness are shown in Table 7.

A broad range of impairment is noted, from "perceptual surprises" through "memory gap for preaccident events," where there is no recall of events well before the accident happened. Some of these categories are tallied for each person more than once when

TABLE 7.—IMPAIRED OR MALADAPTIVE CHARACTERISTICS OF CONSCIOUSNESS AMONG ACCIDENT DRIVERS

	ACCIDENT CLASSIFICATION			
	SINGLE-VEHICLE Drink- ing (N=59)	Not- drinking (N=18)	MULTIPLE-VEHICLE Drink- ing (N=30)	Not- drinking (N=31)
	%	%	%	%
Impairment				
Perceptual surprise	35.6	16.6	33.3	16.1
Fell asleep or passed out before collision	35.6	38.8	6.7	9.7
Memory gap for pre-accident events	18.6	11.1	6.7	9.7

appropriate, consequently the percentages do not necessarily add up to 100 per cent. For the total single-vehicle group (disregarding preaccident drinking or not-drinking) there is a high percentage, 36.4 per cent, of reports of falling asleep or passing out before the accident. For the total multiple-vehicle group, only 8.2 per cent reported falling asleep or passing out before the accident. The difference between the groups is highly significant ($p = .0001$).

Memory deficit may be assumed to involve either more serious impairment at the time of the accident, or reporting contaminated by retrograde amnesia. An example of a report classified as a memory deficit is:

I started to go to the bar to pick up my buddy. I remember I stopped for a red light. I don't remember anything after that.

One of the interesting findings in Table 7 is the higher incidence of perceptual surprises among the drinking as compared with not-drinking accident drivers. Examples of content classified in this category are:³

I was driving along the highway at normal speed—55 mph. I was sleepy but by no means asleep. *All of a sudden* a car loomed up in front of me and I hit it.

I ran straight into the caution light. I should have turned right. *I didn't see the blinker light until the last minute.* I was doing about 60. I normally do about 35 around here. My buddies didn't scream or warn me.

I was doing around 50-60 when I came up to highway 76. I knew there was a stop sign. I was looking to the left *but it came up so quick!* I applied my brakes and cut my wheel to the left at the T intersection. The car just kept going. I seen I was going to the tree and that was it.

One is surprised by events which develop at a pace that exceeds normal expectancy. Events may develop too quickly because one is traveling at excessive speed, because an opposing vehicle comes on the scene suddenly, or because of distraction.

Degraded Anticipation: It has been shown . . . that the drinking driver failed to be more cautious than the not-drinking one. He was likely to travel at somewhat higher

speeds or to fail to slow down for a curve. There appeared to be no significant differences among all groups of drivers in frequency of reported evasive actions. In addition, only 3 per cent of the total of 138 accident drivers reported having been distracted. Accordingly, a degradation of anticipation—in relation to the pace set by the driver—must carry the main burden of explaining the higher incidence of perceptual surprises among drinking drivers. How does the degradation come about?

We assume that safe driving requires active searching for cues to danger, the development of hypotheses about likely hazards, and motor adjustments to these signs and estimates. The hypotheses generate sets which selectively sensitize the driver to relevant information about the self, the car, and the environment. These activities go on at high speed, semiautomatically, in a diffuse informal way rather than as precise formal intellectual processes. F. Allport provides a detailed review of these processes, though not in relation to driving.

To some extent, one may be able to function safely at slow speeds in spite of a *passive* level of functioning of these processes. Alcohol apparently induces a passive level of functioning without creating, at least in some drivers, the intention to reduce speed. However, higher speeds require more active anticipatory processes. The lack of adjustment to this higher demand level or the inability to sustain more active processes, defeated most of the drinking drivers.

There is a broad range of performance capability between peak alertness and deep sleep levels. This range must be accompanied by different levels of mental organization in which emotion, sensory stimulation, drive, interest, and effort all play somewhat different and overlapping roles. The term "activation" has been suggested by Lindsley to describe phenomena which do not guide but simply "energize" activity. Vigilance describes some optimum level of this state associated with low error performance. Boredom, mental blocking, certain types of satiation and skill fatigue refer to low levels

³ Italics added in the quoted reports.

of these activities in relation to the task at hand.

The internal state most clearly associated with the accidents in our cases was a downward shift (i.e., toward sleep) in the level of activity along the sleep-vigilance continuum. Support for this view comes from the fact that out of 39 drivers who had single-vehicle accidents on turns, 64.1 per cent did not react to the curve at all, but went off the road in a straight line without evidence of fighting it until they were well off the road. Another 20.5 per cent reported they actively struggled with the car's direction but were unsuccessful.

Flagging vigilance among single-vehicle-accident drivers is suggested by still another trend. For those cases on whom there was specific information, a left hand turn was involved in more lost-time single-vehicle accidents than a right hand turn. The number of cases is small and not statistically significant, i.e., nineteen had their accidents on left hand turns, and fifteen on right hand turns. However, we suggest as a hypothesis that the geometry of the right hand turn permits a longer safe passage in which to assess course error than a left hand turn.⁴

The concept of passivity of central processes also may be inferred from some data from multiple-vehicle accidents. It is reflected in different proportions of "who ran into whom" among the drinking and not-drinking accident drivers. The following criteria were used to identify the "rammer": (a) The front end of his car hit. (b) In the case of a head-on collision, his car was in the wrong lane. (c) In a sideswipe his car was in motion or was passing.

The type of impact is apparently a sensitive, as well as an objective, index of drinking. Table 8 shows that the drinking driver was more likely to do the ramming than the not-drinking one.

⁴ This question of curve geometry is not ordinarily taken into account in published collections of accident statistics. For instance, the National Safety Council's annual *Accident Facts* (1960) includes tabulations of accidents associated with "improper turns" (p. 52) and "level road" versus "hillcrest" or "on grade" (p. 57), but does not include breakdowns for accidents on curves.

TABLE 8.—"WHO RAN INTO WHOM?" IN MULTIPLE-VEHICLE ACCIDENTS

Group	DRIVER CONDITION		Difference	P
	Drink- ing (N=30) %	Not- drinking (N=31) %		
Airman rammed other vehicle	80.0	51.6	+28.4	.02
Other vehicle rammed airman	20.0	48.4		
Total	100.0	100.0		

The not-drinking driver had an equal probability of hitting or being hit. The drinking driver ran into others four times as often as he was run into. The proportion of rammers among the drinking drivers was significantly greater than the proportion among the not-drinking drivers at the .02 level.

Among the 61 multiple-vehicle accidents, there were 16 head-on collisions. Table 9 shows the distribution of lane positions as a function of drinking for this group of sixteen drivers.

The number of cases involved is small, but the trend is clear. The drinking driver was preponderantly in the wrong lane. Incidentally, the single drinking driver who was in his own lane was hit head-on by a drunken driver who had crossed over.⁵

The typical preaccident conditions of these classes of accidents under discussion seems to have little to do with organic sensory defects, lack of driving skill, poor intellectual assessment of the risks in critical road choice situations, or some self-destructive act released by alcohol. Excessive speed is a frequently reported correlate of the single-vehicle accident, but most of the "speeding" may be appropriate for the road conditions (if not for the individual). Speeding suggests activity and its presence may lead us to overlook the existence of a more

⁵ The fact that almost all the drinking drivers had crossed into the path of oncoming traffic could be interpreted as either a consequence of passivity, or an unconsciously directed act of a self-destructive or other-destructive nature. It is impossible to decide between these hypotheses on the basis of the results presented in Table 9. However, we believe the passivity-hypothesis is more consistent with the weight of evidence presented throughout this article for most of the cases.

TABLE 9.—LANE IN WHICH AIRMAN WAS RIDING IN MULTIPLE VEHICLE ACCIDENTS

Group	NUMBER OF CASES	
	<i>Drinking</i> (<i>N</i> = 10)	<i>Not-drinking</i> (<i>N</i> = 6)
Airman riding in wrong lane	9 (90%)	2 (33%)
Airman riding in correct lane	1 (10%)	4 (67%)

Note.—Because of the very small number of cases, the comparison of proportions is an inappropriate statistic. However, the Fisher Exact Probability Test is applicable. When applied to these data the Fisher test results in $p = .04$.

important psychological process—passivity of those sets necessary for sustained vigilance.

Unconscious Directing Processes: The model presented so far has been concerned primarily with energetic or supporting rather than directing processes, but is there any evidence in the interview data that unconscious directing processes may have generated some of the accidents? Such evidence emerged in many cases. But physical trauma as an aim of these processes turned up rarely. The rarity may be a function of the limited time spent interviewing the driver. Unconscious aims did appear as contributors, but their directions were varied, and the accidents appeared incidental to them. A relatively clear relation between the accident and wished-for physical trauma may be inferred from the following protocols.

In the first illustration the airman left his pregnant wife at a party in order to take another woman for a ride in his yellow convertible:

We were coming back to the party. I came to this intersection three blocks from the party. I hadn't decided yet whether to go back or to cruise around and try to make her. I felt like a horse's butt leaving my wife. I kind of hated her too for getting me excited. I approached the corner at about 50 mph. I don't know if I thought I saw lights or I thought a car might come and I jammed on the brakes. She slipped off and hit her check on the dashboard. There was no car. We went back to the party.

One might infer that the accident was a hostile act which resolved a conflict for the airman.

In the following case there is evidence of emotional disturbance but the accident appears to be the outcome not of a specific desire for it but rather that the turbulence

found expression in driving behavior which served as a tension releasing device. The accident occurred because the form of tension release was maladaptive.

The driver spent all day preparing an apartment for his fiancée who was flying in from abroad. He described himself as being very excited, jittery and nervous. He drank to calm down. He was joined by a buddy. He delayed going to the airport and then left in a panic that he would be late:

We were doing about 90. ——— asked me to slow down. I came to the intersection and saw two cars coming from opposite directions. I didn't see them until I was at the intersection. I thought they had their brights on. I wished the fool on my right would stop, but I knew he wouldn't. I veered to the left and hit the traffic island and passed out.

Another case which reflects tension release as a primary factor is the following. This airman was keeping company with a woman separated from another airman. The night of the accident she told him she didn't feel well. They argued and he left "to go out with the boys." Late in the evening he decided to see her. When he drove past her house he saw her estranged husband's car parked in front of the house:

This made me mad. She was supposed to be separated and she said she was sick. I drove past. I hated women. I stepped on the gas. I must have been doing 100 mph. A big Chrysler was making a turn and his tail was sticking out. I got maybe 100 feet away so I swerved to the right. I hit the curb and lost the wheel. The car headed over the island and ran into a palm tree.

Another example of tension release is reflected in the following:

I was going about 55 to 60 and saw a car down the road that wasn't going fast enough to suit me. It looked like he'd stopped. I said to myself, 'that son of a bitch has stopped. I'll pass him.' I swung out and started to pass but I saw a car coming so I came back and slammed on the brakes. I tried to hit him square so I wouldn't roll.

A number of points are illustrated by this narrative. First, his driving apparently was guided by a generalized psychological tempo or "press" which he seemed to be reluctant to modify. Second, the decision to pass was not made merely on the basis of deliberation

or assessment, but rather contained a large component of impulsive and aggressively-tinged behavior.

The concept of "press," for instance, is illustrated also in the following drinking single-vehicle accident. The driver had been drinking most of the afternoon and early evening with some friends. On his way home:

I felt guilty about not letting my wife know. I was pushing, doing 50-55 when I thought I could in that snow. I don't think I was doing more than 40 at that particular part of the road. I started to fishtail and made the mistake of stepping on the brake. The car spun around.

Still another example of tension release is reflected in the following case:

I was at this party. I had a date with a girl at 12 (midnight). I was in a hurry. I went around the house, made a peel out turn at the corner. I started to speed up in ———. I passed the red light. The road narrowed and I hit the car parked on the shoulder. When I hit I passed out. I think I was doing 55-60. The police say 65-70.

There are other cases where the accident is accompanied by more complex acting out processes in which the accident may or may not be part of the aim of the sets or attitudes. In one, the airman provoked a chase by an air police patrol at night. He attempted to elude it by putting his lights out and turning into a side street where he ran into a concrete stanchion he did not or could not see. This chase-pattern was one of his pre-service hobbies with local sheriffs. The accident was incidental to the pattern, but the pattern itself increased his vulnerability.

Another illustration is that of a father of two children who had been involved in three drinking accidents, but had been hurt only in the last one. He was the middle of thirteen children born to a blind mother and a father who would go on sadistic drinking bouts two or three times a month:

You either had to kill him or get out. One time I got so mad I took a gun to him. My younger brother hid him out at a neighbor's for three days. When he came back he swore off and he has kept his pledge. I left.

On the night of the last accident he ran into an embankment at 50 mph in a 25 mph

zone while trying to avoid a post. (The interviewer and the airman returned to the scene. The post proved not to be there.) His drinking may have been the result of an identification with his hated father. If this pattern did reflect defensive identification with a sado-masochistic father, the airman's accidents might be viewed as masochistically inspired acts, as compared with the father's sadistic pattern.

There is strong correspondence between the experiences narrated by the preceding drivers and Tillmann's analysis of the use of the automobile as "a narcissistic extension of the self." On the basis of his experiences with accident repeaters required to attend group psychotherapy sessions under threat of suspension of their driving licenses, Tillmann concludes:

It is noticed that the group members from time to time have recounted a feeling of rage while driving their automobiles, especially following a situation where they have felt a loss of identity. They indicate a need to express themselves through a medium where they feel they have control over some portion of their feelings. In these instances the automobile has now become an extension of themselves, and they drive it in such a fashion as to channel out these feelings of rage, through a medium where they feel they have mastery. They also fuse themselves with this falsely-acquired power and attempt to exercise mastery over their driving environment as it best suits their needs, *rather than the realistic needs of the driving environment.*⁶

In addition to the aggressiveness noted by Tillmann, we would include other generalized tension release mechanisms.

In the preceding discussion we have examined such data as were available to suggest inferences about preaccident processes. We inferred they were predominantly passive rather than active and that the unconscious aim of the preaccident behavior was more often tension-reducing than self-aggressive.

D. Rapaport suggests that although some might argue that by using lengthier psychoanalytic interviews underlying "self-destructive" impulses may be revealed, this should not be expected in all cases, even theoretical-

⁶ Italics added.

ly. Some of the impulses will be manifestly self-destructive, some of them will not be reducible to such, and some of them will be of an entirely different nature. He raises another possibility—that the reduction in ego autonomy (or surrender of active processes)⁷ may in itself be an instrument of self destruction. But this conception of self destructiveness would be entirely different from those which have been used in the past. In any event, such a possibility further complicates the task of establishing the extent to which an unconscious self-aggressive aim is essential for the occurrence of an accident.

SUMMARY

Correlations between postulated accident causes and accident experience have been disappointingly low. A number of factors to account for these failures of prediction were discussed and two of them were singled out for special attention.

1. The tendency to treat accidents as if they were homogeneous.
2. The paucity of studies concerned with both behavioral and intervening processes at the time of the accident.

The subjects of this study were 138 airmen drivers involved in automobile accidents resulting in lost-time injury. Roughly half of the accidents studied were single-vehicle accidents; this class of accident exhibited otherwise different correlated properties than the multiple-vehicle accidents.

⁷ Ego autonomy might be more completely described as the ability to engage in chosen goal-directed behavior without perceptual, cognitive, or motor compulsion. Active sets are an essential condition for this ability.

The single-vehicle accidents had a substantially higher incidence of drinking drivers, loss of driver consciousness after impact, and reported speeding. The speeding may not have been inappropriate to the road characteristics. Curves were the primary location of this class of accidents, whereas straight roads and intersections were the primary sites of the multiple-vehicle accidents.

While the drinking-driver, multiple-vehicle accident group drew heavily from a population with a home-disrupted background, the drinking-driver, single-vehicle accident group drew equally from two populations of drivers—those who come from disrupted homes and those who are single but do not come from disrupted homes. Drinking probably serves different functions for the two groups. We assume that it serves as a tranquilizer for the home disrupted and serves other needs for the single individuals not from disrupted homes.

Evidence is presented to support the view that the primary preaccident psychic processes for the classes of accidents studied are passive rather than active. While evidence for the operation of a variety of unconscious processes was obtained, the interview protocols do not support the view that the aim of these processes was necessarily to achieve a self-aggressive, destructive end. Rather in many instances their aim appeared to be tension discharge inappropriate to the reality requirements of the road. However, the possibility remains that the shift from active to passive psychic processes may be itself an expression of a destructive aim.

The conclusions reached by these authors should not be accepted without reservation unless confirmed by research using more rigorous methods. The case and control subjects were interviewed long after the events discussed, no objective measure of alcohol use was employed, and the accidents themselves were studied only remotely. Nonetheless, the findings are consistent with a large body of collateral evidence, and the results suggest a number of avenues for further work.

The findings that emotional factors and psychological maladjustment lie behind the drinking habits of some of those who have alcohol-related accidents have important implications for preventive action. Since these disturbances are probably deeply rooted, it is not likely that increasing the severity of the penalty would effect-

ively curb such drinkers from driving. As the authors indicate, some form of psychoanalytically oriented therapy may be required. In a separate article the authors report upon the results of a trial program of this type at a military base (see Chap. 10).

As we noted above, these findings form part of a growing body of evidence that many of those involved in alcohol-related accidents and offenses are socially and psychologically deviant. For example, the earlier work of Schmidt and Smart, based on an alcoholism clinic population, demonstrated that:

1. Alcoholic drivers, compared to the general driving population, are
 - a. involved in a significantly larger number of accidents per year;
 - b. involved in a significantly larger number of accidents per mile driven;
 - c. more frequently convicted of "drunk" and "impaired" driving per time unit;
 - d. more frequently suspended from driving per time unit.
2. Involvement in traffic accidents may be an important factor in precipitating alcoholics into treatment for their excessive drinking.¹⁷

Schmidt and Smart also pointed out that other research has "demonstrated that simple suggestion or exhortatory appeals have been of little value in the treatment of alcoholism and other personality pathologies [and that] on this basis it may be supposed that highway education slogans would hardly affect drivers whose very abnormality immunizes them against such appeals," a point almost universally overlooked. They add that "this might apply, as well, to legal sanctions as preventive measures," a point that needs to be investigated.

Selzer, in a discussion of the same question, has stated that "This approach merely serves to *perpetuate the drinking problem* [italics his], and ultimately returns the alcoholic to a position where he will repeat whatever foible brought him to the court's attention in the first place."¹⁸ He states further that a "major obstacle in rehabilitating the alcoholic traffic offender is the failure to realize that one is dealing with an alcoholic person," and that such individuals should be forced into *medical* treatment.^{12, 18} Arrests for drinking-driving offenses could serve as a means for the early identification of the incipient and chronic alcoholic, a possibility that also needs to be studied. However, the important point here is that there has been but little competent behavioral research concerned with the well-established link between alcohol and accidents and that much needs to be done by sociologists and other behavioral scientists.

These two studies by Barmack and Payne are good examples of attempts to investigate the role of social and psychological variables in early stages of causal sequences that terminate in accidents. The social indices used in the foregoing studies, however, are very crude, representing only the few available background characteristics of the groups being compared. It would be much more desirable to have obtained more direct and sophisticated data about the social and psychological adjustment of the individuals comprising these groups. Obviously not all individuals from broken homes are *ipso facto* disturbed, nor are all individuals from intact homes well adjusted. These considerations must be taken into account in the design, execution, and interpretation of further work in this area.

Three other serious shortcomings of the present studies are acknowledged by the authors. First, the population of airmen is highly selected, overt alcoholics and individuals with severe emotional disturbance having already been eliminated.

Secondly, the number of cases is too small to permit adequate controls on such important variables as age and length of marriage. Thirdly, the sample of accident cases is not representative of all types of automobile accidents but is limited to privately-owned-vehicle accidents that resulted in a loss of duty time for 24 hours or more. To these shortcomings, we would add doubts as to the validity of the respondent's own reports about how much he had had to drink and his judgment of his parents as being problem drinkers. Also informative would have been some determination of the individual's personal responsibility for the accident—for example, through the study of the dynamics of the crashes themselves. In addition, it is of crucial importance to take into account the fact that individual and social factors may themselves be associated both with alcoholism and with increased accident rates.

One word of caution: It is important in this type of research not to look for psychological explanations when other possibilities—often less complicated—may better fit the facts. Thus, for example, Barmack and Payne stipulate a choice between two possible causes of the crossing into oncoming traffic on the part of the drunken driver. However, simulator studies show that the drinking driver tends to avoid the margin of the road in favor of a more central position (see Drew *et al.*, Chap. 6), apparently because the alcohol-increased variability about his mean path would put him off the edge of the road on the right if he did not place his mean path closer to the middle. In two-way traffic the result is that his deviations to the left of his path overlap the opposite lane. Thus, there is little need to assume a complex mechanism for this phenomenon, which has been produced in the laboratory on a purely pharmacological basis. This example illustrates again the problem inherent in approaching accidents from only one disciplinary standpoint and the need for the research worker to be familiar with the pertinent collateral fields.

BEHAVIORAL APPROACHES TO ACCIDENT RESEARCH*

In general, the sociological approach to accident research has not been widely utilized, and it is only recently that attention has turned to the role of social variables in accident causation. A conference held in April 1960 by the Association for the Aid of Crippled Children brought together a number of social scientists to examine the possible application of social theory and method to accident research. The papers delivered at that conference have been published in *Behavioral Approaches to Accident Research*. Some of the many interesting ideas to come from this conference relevant to social and cultural factors are excerpted below. These excerpts and the foregoing material in this chapter indicate that social research on accidents has a significant contribution to make to both their understanding and control.

* Association for the Aid of Crippled Children, 1961.

ON SOCIAL VALUES

OUR SOCIETY is inconsistent here, requiring on the one hand strict regulations pertaining to the maintenance of airplanes, and on the other hand permitting the installation of steep and potentially slippery stone stairways, lacking adequate banisters, in public housing projects. We station a policeman at school crossings, but in large sections of all urban areas children are forced to play in the street because the nearest playground is half a dozen blocks away. In addition, a significant percentage of children's accidents take place in playgrounds, and probably increasingly in the mushrooming housing project play areas. A good number of these accidents come from falls onto concrete pavement, from swings, slides, and the like. For the last decade, new playgrounds in Germany and in Sweden have been surfaced with a composition that has great resiliency and yields upon impact. How many of our playground accidents would be simple mishaps if we too insisted on the use of such composition in the surfacing of playgrounds?

—MARTIN DEUTSCH, Ph.D.
p. 101

LITTLE IF ANY RESEARCH has been done on the relationship between cultural values and accidents among children. There may even be some doubt about what kinds of accidents and how many accidents our culture will consider desirable to eliminate. We cannot assume that an accident-free culture is a reasonable or even desirable goal within our society. If one views as a key theme in the accident potential both the possibility and the reality of "chance-taking" as a basic, fundamental American life goal, then this limitation which culture may impose should be realistically examined in safety-education and accident-prevention campaigns.

The role of a man is all too frequently defined only in terms of "courage," with success stories throughout our history placing a premium on "taking a chance." The pioneers took a chance; they were courageous

"killers of bears." These themes are instilled into the growing child without regard to sex. This is what Davy Crockett did, this is what the Space Cadet does. Yet children who are the accident repeaters are boys. They are not only trying to show what they can do, but statistics prove that they *do* show what they *can* do: they are courageous, strong, impulsive, but they are also dangerous, not only to themselves, but to everyone around them—particularly if the masculine role is being enacted by a five-year-old. Girls emerging from common patterns of babyhood suddenly learn, however, that their adult role is to be a different one. To what degree are girls taught the "safe" way in that all-important area of the manipulation of cultural artifacts to explore and control them? This is fundamentally considered to be a man's responsibility, and girls grow into womanhood often lacking both the skills and attitudes necessary for effective control. Cases in point are the dull kitchen knife and improper can opening as women press too hard to peel off the top of a tin can.

True, electric can openers have replaced the old-fashioned can opener, and safer and better equipment is constantly being designed to eliminate physical hazards at their source. Yet non-fatal accidents, according to recent surveys, happen most frequently in the kitchen, whereas accidental deaths are reported most frequently in the bedroom and other "living areas" in the home. Is it safe to assume that there is some correlation between these statistics and masculine and feminine roles? How far can a program of re-education go? Will it cut down the spontaneity, creativity, and the core value of "taking a chance" as a masculine goal? What are the possibilities of effectively preparing girls so that they too may be trained to live in a technological society? How much safety can education realistically build into a society?

—ETHEL J. ALPENFELS, Sc.D.
ARTHUR B. HAYES, III
pp. 107-108

THE INTELLECTUAL COMMUNITY of the United States of late has been particularly concerned with the disparity between individual affluence and public squalor. In few places is this disparity better illustrated than in the field of childhood accidents. We do not plan our roads, our streets, our cities to provide safety for the children. We build superhighways to facilitate the flow of automobiles, but we do not provide walking space for pedestrians. At the same time we destroy acres of countryside that might be used for playground and other activities. I was glad to read recently that a League of Pedestrians had at last been organized in order to defend the rights of pedestrians in our complex community. Often what safety precautions are available are fortuitous rather than according to plan.

* * *

... The construction of tunnels, bridges, pedestrian pathways, and a host of other safety devices actually requires no great research planning on the part of safety engineers. The problem lies more in the area of the political, social, and behavioral. Why is there indifference to safety on the part of legislative groups and large segments of the public? It is not uncommon in New York City to drive along a street and suddenly have to turn off because a group of mothers is picketing with signs appealing to the commissioner of traffic to declare this a play street or to post a policeman there. Of one thing the driver can be certain—very recently a child there had either had a serious accident or been killed. I am certain that this is not a problem only for the urban centers but also one for the rural community. Every year many children are involved in accidents with farm machinery, and very few states prohibit youngsters from working with such machines.

There is great reluctance to impose social control through interference with family life. However, there are precedents in our child labor laws. Industries in which minimal hazards may be found, not even at the job but in the area or within the plant, are forbidden to young workers. There is good

reason for this differentiation, since research has indicated that frequency of accidents is significantly higher for younger than for older workers. This would be an interesting problem for behavioral science, since one might think that, with his motor system at its very best, the younger worker would have a better safety record. It is also of interest that the enforcement of child labor laws has been greatly aided by the workman's compensation laws. An employer who illegally employs a youngster who is injured on the job must pay double compensation. This discourages employers from violation. There are, thus, precedents for social control in the prevention of accidents.

—ALFRED M. FREEDMAN, M.D.
pp. 119-120

TO WHAT EXTENT can we apply such concepts as mass screening and early detection of "accident-labile" cases to accident prevention? Certainly industry has made successful use of such screening and detection programs to reduce industrial accidents dramatically. This seems to involve a question of social values. . . . When the public is willing to accept the same type of preventive program for accidents as it demands for the communicable diseases, we may witness tremendous gains in removing accident from its current position as one of the major causes of death and disability.

—EDWARD A. SUCHMAN, PH.D.
pp. 40-41

ON CULTURAL FORCES

WHAT PERSPECTIVE can be gained of accident involvement by comparing our behavior with that of other cultures? An unproved assumption is that in other cultures there are fewer accidents involving children. But training is relative to the fewer number of "things" in nonliterate societies and to fewer dangers arising from the "new."

Briefly, then, our considerations lead us to the belief that:

(1) Cultural factors are basic to and directly

associated with the phenomenon of accident involvement.

- (2) The dynamics of culture change create greater likelihood of accident involvement because rapid acculturation tends to create conflict.
- (3) The study of the **thematic and value structure** as related to the institutions of a society may provide us with the basic reasons for accident involvement and a better understanding of how conditions may be manipulated to effect change.
- (4) There are many intricately interrelated factors which make our Western world very much open to accident involvement.
- (5) Any meaningful structural program in accident prevention must be aware of and founded upon the knowledge of the cultural factors involved.

Further investigation in these areas is clearly needed.

—ETHEL J. ALPENFELS, SC.D.
ARTHUR B. HAYES, III
p. 109

ON SOCIALIZATION AND DEVELOPMENT

ALTHOUGH PARENTS and parental surrogates have total responsibility for protection of infants against accidents, with the developing child's increased interaction with the environment, parental responsibility becomes less direct and more subtle in its influence. More and more it is child-rearing practices rather than objective environmental manipulation on the part of the parents which influence the degree of protection the child has from accidents. In this area as in all others, the influence of child-rearing practices is on the internalization of behavior controls—in this case accident-prevention mechanisms.

General theories of the relationship of behavior to child-rearing practices are as applicable here as elsewhere; behavior in regard to accident prevention can thus be seen logically as a special case of general behavior. For example, a highly intelligent child of three might have been carefully instructed as to why he should not chase a

ball into the street. The parent, not fully aware of the limitations on comprehension at a particular developmental stage, might not recognize that the ball can offer an all-encompassing stimulus, and that an antecedent explanation has insufficient inhibitory effect. At this concrete, non-verbally mediating stage, direct and repeated avoidance conditioning might offer more security, just as the same technique might at the same stage be most effective in teaching the child not to hit the dog or not to push the flower pot out of the window.

Emphasis in analysis, then, must be placed on the relationship of child development and behavior to accidents and the influence of child-rearing practices on this development and behavior. It is not possible here to explore the full range of child-rearing practices and their relationship to accident frequency and prevention, but it is felt that one of the most fruitful areas for exploration would be the fostering and management of independence.

With reference to accident prevention, underprotection would have the most direct and immediate negative consequences in that the growing child finds himself in situations that are beyond his physical control or conceptual integration and is dependent on an adult's protection. In addition to the direct danger accruing from underprotection, however, there is a more subtle threat. There is essential orderliness in the child's developing ability to assimilate progressively more complex configurations. This orderliness exists despite, as Piaget points out, inconsistencies in developmental levels of different functions. For example, empathy must follow development of identity and sympathy. Perception of geometric forms comes after size judgments, and the principle of the conservation of quantity is antecedent to the concept that form and quantity are independent. Because of these developmental sequences, the child is dependent on the adult not only for overt protection, but also for the provision of an environment which is congruent with his current developmental level. To be exposed to situations which are

developmentally too complex can be confusing and disorganizing for the child, and when such a situation also has an element of risk, there can be real danger for the child, even though objectively to the adult it might not appear to be a dangerous situation.

To make a conscious decision to take a risk and to attempt to calculate the subjective and objective probabilities in a risk presumes a history—even if a very short one—of making similar decisions and calculating the risks. The underprotected child who had to assume risks before he had the cognitive development to anticipate them would find greater difficulty in protecting himself from accidents. This is not to say that underprotected children develop in any homogeneous manner. In some cases it may well be that by exposing them to more small mishaps, the underprotective environment also facilitates concrete cause-effect learning which might in turn facilitate environmental control and self-protection on the part of the child. The problem is that at the same time that the underprotected child is exposed to mishaps, he is also exposed to the possibility of serious accident. It must be remembered that we are not dealing here with a phenomenon that allows for a one-to-one relationship between environment or personality and accidents. Rather, there are probably various clusters of organismic, environmental, and experiential variables that combine in various relationships to increase or decrease accident probabilities. With this in mind, let us turn to the problem of overprotective child-rearing practices and their potential relationship to accidents.

The danger of underprotection is that the child would be placed in situations too complex for his developmental level: that is, in circumstances not suited to his degree of cognitive and physical maturity. The danger of overprotection is also that the child's level of development and his situational context will not be congruent, but, in this case, the child's development would be more advanced than the situations in which he was allowed to function and than the implements which he was allowed to handle.

For example, a knowledge of the causal interrelationships between events or things might be necessary for the child to avoid juxtaposing various implements in a possibly accident-producing sequence. The conceptual level required to perceive causal relationships is not reached by the sudden maturing of certain innate propensities. Instead, there is a fairly wide range in age, during which children develop precausal and causal explanations for events. The time at which a fairly stable notion of causality is achieved is probably a function of a combination of interrelated but not necessarily interdependent factors: intellectual level, verbal development, experience, and possibly some innate maturational factor. The overprotected child who is thus limited in the variety of his experiences is less likely to learn through his own concrete manipulations cause-and-effect relationships at the earliest time at which he could, developmentally, appreciate them. The lag on this level would extend to all overt exploratory operations. This would not only impair his understanding of concrete cause-effect sequences but it would retard his developing confidence and security in his own abilities to manipulate and control objects in his environment.

This process would have consequences for accidents. It would directly limit the ability of the child to anticipate events and to take appropriate protective measures. Further, and possibly more important, it might greatly reduce the frequency of the previously discussed trial-and-error mishap learning. The minimizing of this negative reinforcement sequence could reduce the child's later cognitive appreciation of the injury potential in certain risk-taking decisions. A thesis here that should be subjected to investigation is that the overprotected child will have fewer mishaps and serious accidents in early childhood than other children but will have a disproportionate number of major injuries later in childhood and during adolescence when the protectiveness covers an increasingly smaller part of the child's day. There are, in fact, some data to indicate that a higher proportion of adoles-

cents involved in serious highway accidents have independence-dependency problems and a history of overprotection.

In general, it would seem that the consequences of overprotection are just as deleterious in accident prevention as in the other areas with which they have been associated. Stunting of initiative and of the development of self-confidence have as negative implications for accident prevention as they do for mature emotional development. The restriction of normal risk-taking in the early, formative years can be the poorest and most dangerous preparation for highway driving.

Although degree of protectiveness is probably the broadest child-rearing practice category logically related to accidents, the punishment-discipline cluster also has an immediate relevance. Again the relationship can hardly be conceived as a one-to-one ratio, but some of the apparently crucial areas can be mentioned and indeed must be hypothesized in order to be made testable.

The absence of consistent disciplinary measures deprives the child of experience in anticipating consequences. It would probably serve to reduce a child's ability to calculate the degree of risk involved in a particular activity. Lacking adult assistance in interpreting environmental vicissitudes, the child would be less able to cope with unexpected situations. As for disciplinary measures, what is important is probably less the discipline per se than the object and area of the child's life which is most singled out for punishment. Is risk-taking behavior particularly singled out for punishment and, if so, what kind and degree of risk is most frequently punished? Is the child more likely to be disciplined for a physical or for a social risk? Here there probably exist major social class and individual personality variables which determine the parent's threshold for perceiving danger and for the importance he ascribes to various negative consequences.

It might be more likely that the overprotective parent would apply sterner protective disciplinary measures in risk situations, though he might be overindulgent in regard to other behavior. But it is also possible that

the overprotective parent does not treat risk-taking situations differentially, whereas the parent who falls within the average range in protectiveness might single out for special restriction all risk-taking situations. Thus, the area of discipline criss-crosses with the protectiveness continuum.

Probably the child who is least prepared for emergencies is the one whose parent is highly overprotective and who in addition singles out risk-taking behavior for special discipline. Also, it would be valuable to investigate if in middle- and upper-middle-class families there is a relationship between age of child and disciplinary tempo toward risk-taking situations: the parent who applied strict discipline to the young child in athletic activities could be the parent who, with minimal concern for the existence of the relevant maturities, would buy a car for an adolescent child. Suggested for study is a possible relationship between strict early discipline for risk-taking and a subsequent breakdown of this strictness when the child achieves relative independence; the high adolescent highway accident rate could be contributed to disproportionately by children who have not been permitted to have the range of childhood risk-taking experience but who are permitted to take adult risks without being ready for them.

In this discussion of individual factors in accidents, the question of sex differences has not been raised and the question of class differences has not been fully discussed. This is because the obvious potential relationships between such variables as girls having more accidents in the home at a certain age, sex and cultural differences in the valuing of activity, and the like do not need explicating here. For the more subtle or refined relationships between these and similar variables and accidents, much more empirical data are required.

In probably the overprotective and in the highly disciplined models, control of the child's behavior is attained through the generalization of fear of risky situations and potentially harmful instruments. Through the inculcation of fear of punishment or of

danger in new situations, the child can easily become afraid of unfamiliar things. Thus, the most characteristic element in development, the continual experiencing of new situations, becomes restricted. It is probably that the organism's ability to integrate perceptual, cognitive, and motor responses in emergency situations is highly correlated with previous such mobilizations and with degree of familiarity with the relevant context. Less familiar situations carry with them unexpected properties and would be reacted to with a higher degree of fear. Clinically, the disorganizing and tension-producing properties of fear are well recognized, and the role of fear in depriving the organism of protective responses in emergency situations probably contributes to the involvement of many people in accidents that might have been avoided. Thus fear of new situations deprives a child of learning mishaps and experience in risk-taking and also makes it more difficult for him to mobilize his capabilities when an accident-potentiating situation intrudes on him.

—MARTIN DEUTSCH, PH.D.
pp. 96-100

IN MODERN industrial society, and in the special child's world that the West has created, our children imitate adult behavior in their play, *but* we have scaled down the tools of imitation so that they demand limited self-control of the child as he uses them. In the nonliterate societies, by contrast, when the child begins to imitate the activities of the adults, he is forced to learn them within the totality of the culture. His weapons may be miniatures, but the knife is just as sharp, the arrow point just as lethal, the hunt for crickets as deadly in earnest as that of the adult male.

Within this cultural whole, within this reality of act and thought, the child grows, and the relationships thus established tend to remain stable and well defined. The division of labor between men and women is constant, and the child's expanding role is anticipated and fully known. The hazards are not

eliminated. The weapons are not for "play"; the child is taught to use them, to control them for exactly the same reasons as the adult. Hazards are among the realities of his life. As the child grows, as he learns physical manipulation and control of his environment, the attitudes and prescriptions of the adult world are both expected and little changing.

In contrast, in the technologically oriented society, the gun becomes a "play" gun but it must *look* like a real gun even to the most minute detail. We spend fortunes imitating the "real," and the child learns the details; he can name every part almost as soon as he can speak. The knife is not a *real* knife and even the doll must not have button eyes lest the child chew on them. Here the life theme is constant change rather than stability. This creates further hazards for the child. Behavior patterns with known toys, learned as a child, may become obsolete and rules surrounding their use no longer applicable in perhaps ten years' time. Toys suddenly become "boys'" or "girls'" toys, and masculine and feminine attitudes toward playthings begin to assert themselves, requiring the learning of a whole new set of behavior patterns defining both act and attitude. In sharp contrast with the nonliterate (or even with subcultures within the larger society), play is a child's activity and is taught in "childish" ways. Growth and education are accomplished through as complete an elimination of hazards in the environment as scientific skill can attain. We eliminate the necessity for the controls that need to be "built-in" for use as adult instruments.

Why have we done it? The small, conjugal family of middle class, the fewer numbers of older and more responsible siblings, the introduction of supporting institutions which share parental supervision and family functions, the stress on individualism necessary to an economic-oriented society, all these support and maintain a special, isolated child's world which the child must, somehow, through a mystical transfer of learning, transcend in order to know how to handle a

"real" gun when it is left carelessly within his reach by an adult.

Is there a causal relationship between the number of accidental deaths by guns—the fourth killer in American homes last year—and the "play" gun which is pointed at both the imagined and real giants of a child's world? Why is there this fantastic rise in deaths by guns for children between the ages of 4 and 14?

Every aspect of the world surrounding the growing child is delineated into *playthings*, which are kept separate, or into *reality*, which must be kept businesslike, purposeful, serious. Over and over we debate such questions as: "Should children play on fire escapes?" In the October 1960 issue of *Safety Education*, four out of five specialists in safety education said, "Fire escapes are not intended as playthings but are special equipment to be used intelligently and effectively in an emergency." The fifth, a psychologist, answered that the "fire escape emotionally . . . [becomes] . . . the Forbidden Path . . . and this policy damages both duration and the impact of physical acquaintance with the fire escape."

—ETHEL J. ALPENFELS, SC.D.
ARTHUR B. HAYES, III
pp. 104-105

ONE IMPORTANT POINT which, I feel, has had virtually no attention but should receive much is the empathic ability of the parent. If a parent acts toward the child as if he expects the child to perceive dangers but the child has not yet learned these, we can say the parent shows poor empathy, especially if he knows something about the limitations of the child. But far worse, what if he not only shows poor empathy but also is truly ignorant of the developmental facts of children's perception and understanding? I believe that this is the case far too often. So many times has the visiting nurse heard the mother say, "How could he have drunk kerosene with that awful taste?" And if the woman doesn't know that this is possible and how it is possible, she has the somewhat

sad companionship of our scientists in her ignorance. These two factors—ignorance as to children's capacities and inability to assume the position of the child in his own world—are of the greatest importance in many classes of accidents in which blame attaches to the parent as the major controller of the accident situation.

—BERNARD H. FOX, PH.D.
p. 54

ON SOCIAL DISORGANIZATION

ACCIDENTS HAVE a significance beyond themselves. They are always symptomatic of disorder in a particular dynamic system. The disorder may reside in the habits of an individual or the customs of a community or the breakdown of a machine. The occurrence of an accident, no matter how trivial or how serious, is an unerring signal that something or someone is not functioning properly. Studies on the relationship between socioeconomic class and mental illness have revealed a tremendous and disproportionate concentration of mental illness in the lowest 20 percent of the population—lowest as measured by where the people in this segment live, what kind of work they do, and how much education they have had. Studies might well show a similar disproportionately high accident frequency in this lowest socioeconomic segment, clearly revealing the additional multiple stresses under which its members operate. This disproportion (to speculate) may be most pronounced in home and occupational accidents and somewhat less marked but still very considerable in public and transportation accidents.

It may be that the national accident death rate has fallen during the past several decades for very much the same reason that the tuberculosis death rate has fallen: a general rise in the standard of living. In other words, it is possible to speculate that the less individual and social disorder there is in a community, the lower the accident death rates will tend to be; and, conversely, accident rates over-all, or in terms of particular types

of accidents, may some day yield an accurate index of deficiencies in various human and environmental systems (family, highway transport, etc.) in particular communities.

—JOHN MACIVER, M.D., M.P.H.
pp. 71-72

ON AGE DIFFERENCES

EPIDEMIOLOGICALLY, some groups of both children and adults are more prone to accidents than are others. Leaving aside for the moment demographic variables, let us consider individual characteristics of children which might relate to the number of mishaps and of more serious accidents which they might experience.

The studies of children's accidents seem to agree that more active children are more likely to have accidents. It can be suggested that these children are more actively exploring and have a higher-than-average range of variegated experiences and, hence, are more likely to be exposed to more accident-producing conditions. It would be an interesting research problem to determine whether the ratio between attempted explorations and behaviors and accidents would actually be higher or lower for the active child as compared with the ratio for the less exploring child. The active child who takes the chances inherent in mastering the jungle gym at the age of two might also have sufficient understanding as to why he should not stand up and attempt to walk down a slide, but a similar child with the same lack of comprehension but without the same history of coordinated motor activity, when descending the slide, could more easily fall and accrue a serious injury. That is, the child with a history of motor dexterity and confidence in it might be less likely to sustain severe injury even in the same accident situation. He would be better able to mobilize his responses in an emergency.

However, there are at least two other classes of children in relationship to the slide. One would be a group who have repeatedly had the dangers involved explained to them, with emphasis on sliding activity and how to

perform it; another group might have instead been repeatedly cautioned about the dangers inherent in the slide, and the fear thus aroused may have become generalized to the total activity. In this situation, the paralyzing effect of the fear on motor behavior could be an accident-causing agent. It seems possible that there would ultimately be a lower rate of, for example, playground accidents among children who have a highly variable level of complex motor adaptation in play, and among those who have had repeated objective verbal introduction into a situation, than among children with limited experience or with negative familiarization. Further, the child with the higher rate of early and successfully integrated activity and with a concomitantly higher accident rate might at an older age become identical in his accident frequency, if not in cautiousness, with the more average, less active group. Developmentally, the "daredevil" child might always lag in cautiousness but not have a higher over-all accident rate.

* * *

The individual characteristics that have been discussed relate to whatever inherent activity levels there may be in children, but they relate also and more strongly to the parental handling of the children's activity. Thus parental influence is related to incidence of accidents at least indirectly in the child who is already capable of some independent action. Earlier in life, in accidents as in all other activities, parental responsibility is quite direct.

At the earliest stages of life, the child is most likely to be the passive recipient of accidents. At these early stages, and only there, there is no possibility of the victim's anticipating the danger or being able by his own actions to ward it off. Here it is the complete responsibility of the parents to anticipate and order the environment in such a manner as to minimize accident potential. There are probably social-class differences in both the ability to erect adequate safeguards and in the confidence to maintain the necessary situational restructuring. Statistics indicate

that during infancy, the categories of accidents which have the highest frequency are swallowing noxious substances and objects, asphyxiation, burns, and falls. If morbidity figures could be included, rat bites and handling by physically underdeveloped siblings in lower-class and slum neighborhoods would probably contribute significantly.

Parents in these situations may be as unable to control such accidents as their infants are unable to protect themselves. Epidemiologically, there is evidence of higher accident rates among lower-class children. Though fatigue and malnutrition are contributory factors, the primary participating variable might be a fatalistic attitude on the part of lower-class parents as to the inevitability of injury and the degree of danger always existing in the environment. These are people who have little influence in society and who therefore feel powerless to influence events.

If this thesis is valid, in the child-rearing practices of lower-class homes there would be less emphasis on teaching children accident-avoiding behavior. This is a hypothesis which could certainly be tested by research and, if it has validity, would point up one area for a program of accident prevention. Of course, the lower-class child also has more independence at an earlier age, and thus more opportunity for individual exploration and activity. Consistent with the hypotheses advanced earlier, though, perhaps these children have higher early accident rates but more average ones as they become more physically capable and cognitively better able to generalize.

—MARTIN DEUTSCH, PH.D.
pp. 94-96

IF WE CHOOSE any individual, young or middle-aged or old; male or female; well-off or poor; healthy or sick; well adjusted or poorly adjusted; if we add to this a brief description of his daily activities, we can draw sharp inferences as to the risks he is exposed to. Perhaps the basic distinction to be made is that of sex. Men are the victims in more than two-thirds of the accidental deaths that

occur in this country each year. Deaths among males predominate in every important category except falls. Men have an almost exclusive corner on the occupational category. In recent years, only about twenty-five deaths have occurred each year in the U.S. among white women at the main working ages.

The type and frequency of accidents vary greatly in different age groups. The infant and child combine ignorance of the environment with a decided bent to explore and discover. Thus, in the first years supervision has to be almost constant. Freedom from a completely protected environment can be granted only gradually and with the exercise of caution at every step of the way, since new hazards arise as the importance of others diminishes.

The adolescent and young adult present a problem different from that of the child. Physically they are fully developed, at the peak of health, bursting with energy. They are not, however, as mature as they may appear to be, and they are characterized by unpredictability, impulsiveness, and brashness or even absence of considered judgment. The process of psychosexual maturation largely determines the behavioral characteristics of this group, a fact which is often ignored, forgotten, or denied.

In the mature and productive years, the years of healthy adulthood, the pressures of our way of life—the speed-up and resulting stress—no doubt play a significant part in the occurrence of accidents. From middle to old age there is a steady decline in certain physical and psychological attributes. Bones become more brittle. Reflexes are slowed. The sensory apparatus, such as the ability of the eye to adapt to changes in light intensity, deteriorates. Prominent evidence of this deterioration is to be found in the increased frequency of falls and pedestrian accidents among the elderly.

Physical and psychological characteristics of human beings are closely connected with accident susceptibility. For example, children of one and two are avid explorers of the environment but are not sufficiently

coordinated or muscularly developed to cope with water. It is not surprising, therefore, that two-thirds of the drownings in the preschool group occur at ages one and two. Similarly, fatal poisonings in preschool children predominate at ages one and two, since the bent for exploration involves much testing by tasting (and swallowing). One of the common poisons—the salicylates, of which aspirin is best

known—points up a difference in the physiology of small children. It is difficult to poison an adult or even a grade-school child with aspirin, which in these age brackets is one of the safest drugs known. The metabolism of the small child, however, is peculiarly susceptible to an overdose of this agent.

—JOHN MACIVER, M.D., M.P.H.
pp. 61-62

REFERENCES

1. Moynihan, D. P., "The Legal Regulation of Automobile Design," in *Passenger Car Design and Highway Safety*. Association for the Aid of Crippled Children, New York, and Consumers Union, Mount Vernon, 1962, pp. 265-285.
2. Haddon, W., Jr., "The Prevention of Accidents," in *Textbook of Preventive Medicine*, eds. D. Clark and B. MacMahon. Boston: Little, Brown & Co. In press.
3. Read, J. H., Bradley, E. J., Morison, J. D., Lewall, D., and Clarke, D. A., "The Epidemiology and Prevention of Traffic Accidents Involving Child Pedestrians," *Canadian Medical Association Journal*, 89:687-701, 1963.
4. First Report, Expert Committee on Alcohol, Technical Report Series No. 84. World Health Organization, Geneva, 1954.
5. Selzer, M. L., and Payne, C. E., "Automobile Accidents, Suicide, and Unconscious Motivation," *American Journal of Psychiatry*, 119:237-240, 1962.
6. Kempe, C. H., Silverman, F. N., Steele, B. F., Droegemuller, W., and Silver, H. K., "The Battered-Child Syndrome," *J.A.M.A.*, 181:17-24, 1962.
7. *Report on Impaired Driving Tests*, ed. B. B. Coldwell. Crime Detection Laboratory, Royal Canadian Mounted Police. Ottawa: Queen's Printer, 1957, p. 218.
8. Rainey, R. V., Conger, J. J., and Walsmith, C. R., "Personality Characteristics as a Selective Factor in Driver Education," *Highway Research Board Bulletin*, 285:23-28, 1961.
9. Coppin, R. S., "A Controlled Evaluation of Group Driver Improvement Meetings," *Traffic Safety Research Review*, 6:3:17-23, 1962.
10. Haner, C. F., "Use of Psychological Inventory in Writing Insurance for Youthful Male Drivers," *Traffic Safety Research Review*, 7:1:5-9, 1963.
11. Haddon, W., Jr., "Alcohol and Highway Accidents," in *Alcohol and Road Traffic*, Proceedings of the Third International Conference on Alcohol and Road Traffic. British Medical Association, London, 1963.
12. Selzer, M. L., Payne, C. E., Gifford, J. D., and Kelly, W. L., "Alcoholism, Mental Illness, and the 'Drunk Driver'," *The American Journal of Psychiatry*, 120:326-331, 1963.
13. Borkenstein, R. F., Crowther, R. F., Shumate, R. P., Ziel, W. B., and Zylman, R., *The Role of the Drinking Driver in Traffic Accidents*, ed. A. Dale. Department of Police Administration, Indiana University, Bloomington, 1964.
14. Bjerver, K. B., Goldberg, L., and Linda, P., "Blood Alcohol Levels in Hospitalized Victims of Traffic Accidents," Proceedings of the Second International Conference on Alcohol and Road Traffic. Toronto: Garden City Press Co-operative, 1955, pp. 92-102.
15. Goldberg, L., "Drunken Drivers in Sweden," *ibid.*, pp. 112-127.
16. Smart, R. G., and Schmidt, W. S., "Problem Drinking as a Factor in Drinking Driving Offenses," *The Canadian Journal of Corrections*, 3:153-158, 1961.
17. Schmidt, W. S., and Smart, R. G., "Alcoholics, Drinking and Traffic Accidents," *Quarterly Journal of Studies of Alcohol*, 20:631-644, 1959.
18. Selzer, M. L., "Automobile Accidents and the Alcoholic Personality: An Unrecognized Dilemma," *Michigan State Bar Journal*, 39:4-15, 1960.