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PSYCHOLOGICAL APPROACHES

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THE STUDY OF ACCIDENTS from the perspectives of psychology hardly requires justification. To the extent that accidents involve human behavior, they must inevitably be studied with the science that deals with the behavior of the individual. And, in fact, psychological theory has been applied to accident phenomena by a wide variety of people, ranging from the layman who believes that accidents are caused by "the nut that holds the wheel" to the experimentalist studying the legibility of road signs or speedometer dials.

Potentially there is hardly a field of psychology that does not have implications for accident research. As a field of study, however, psychology has become so broad and complex that one cannot generalize about its applicability to accidents—either in terms of the utility of its conceptualizations or the value of its research findings. Therefore, instead of attempting to subdivide the field and examine the relevance and the findings of each of its subdivisions, let us examine some of the aspects of the individual that relate both to accidents and to psychology and then review examples from the wide range of psychologically oriented accident research.

Perhaps the broadest area of human behavior that is relevant to accidents—and certainly the area that has been subjected to the greatest amount of psychological research—is the capacity of the human organism to respond appropriately to sensory stimuli. Color perception, depth perception, perceptual constancy, spatial discrimination, reaction time, kinesthetics, and similar essentially psychophysical phenomena all may have relevance to the avoidance of hazards, whether in a primitive or a highly technological environment.*

Learning theory has not yet been applied systematically to the learning of accident-avoidance, but some psychologists have hypothesized that the disproportionately high frequency of highway accidents involving adolescents may be due not only to characteristics peculiar to adolescence but also to the frequency of "inappropriate responses" that is characteristic of the early stages in the learning of any complex skill (see McFarland and Moore in Chap. 8 and reference 2).

Studies of the individual's cognitive processes have implications not only for the teaching of safe practices but also for the selective screening of individuals for occupations that directly involve the safety of others as well as themselves. An understanding of his cognitive processes may yield knowledge of how an individual assesses the hazard in a given situation and would appear to be especially important not only in drivers, pilots, and machine operators but also in governmental and industrial executives, manufacturers, and other planners whose decisions influence the safety of entire populations. The pertinent characteristics of such key individuals, however, have yet to be explored scientifically. The importance of small numbers of crucially placed individuals in accident causation and prevention is easily seen day by day. The small numbers of individuals responsible for the design, course, and speed of the *S.S. Titanic*, for decisions with respect to the crashworthiness of vehicles, and for the placement and strength of dams illustrate this well, as do many other aspects of the modern environment.⁴ This is perhaps the most important unexplored area of particular interest to psychologists and other behavioral scientists concerned with accident causation and prevention.

* The psychologically oriented accident research literature may be entered through the reviews prepared by Thorndike,¹ McFarland *et al.*,² Goldstein,³ and Cresswell and Froggatt^{3a} and through many of the papers published in the *Traffic Safety Research Review*.

The study of human development, growth, maturational processes, and aging is significant for an understanding of certain accidents because the capacities of both the child and the aging individual for concept formation, for perception, and for motor response appear to differ sharply from those of the adult in ways that may make them differentially vulnerable to environmental insult. For this reason the application to the young and the aged of conclusions reached through the study of young adults is highly questionable.

Work in social psychology—not only on the general effect of the social group on the behavior of the individual but also on the social values and processes that affect risk-taking—is also relevant. So, too, is further understanding of the effects of frustration, aggression, and various environmental distractions upon stimulus discrimination, attention, perception, and motor response.

Behavioral deviation—whether produced by transient or prolonged emotional disturbance, chemical agents, or organic deficit—may affect the safety not only of the deviant but of others. Regardless of the validity of accident proneness as a global concept, there are many indications that emotional states—acute or chronic—may alter the incidence of accidents, but the scientifically adequate supporting evidence is not extensive. Similarly, although there is much scientific information on the association between alcohol and motor vehicle accidents, little is known at a highly specific level about the effects of alcohol on many of the segments of behavior that may lead to these and other accidents. In addition, although there are various restrictions on the licensing of individuals with certain sensory impairments, the precise effects, if any, of such impairments on accident rates remain to be defined and measured, and it is likely that at least some of the current “common sense” measures will prove inappropriate when their merits are properly studied.

Despite the potential value of psychological approaches, however, psychological studies directly related to accidents have not generally been highly fruitful. In terms of practical value, it seems probable that work in visual perception has had the most profitable and widespread application—to the design of gauges, to the choice of colors for signs, aircraft, and other equipment, and to the design of various items of military and civilian hardware (see McFarland in Chap. 2 and reference 4). However, there is increasing evidence of the potential contribution of approaches outside of the psychophysical area. This is reflected in several of the papers that follow and, for example, in recent work relating psychological and other characteristics of groups of drivers to their insurer's subsequent claim experience.⁵

Despite such progress, our understanding of the relationship between personality characteristics and accidents is still seriously limited. For example, the accident experience of patients in psychotherapy has not yet been subjected to adequately systematic and extensive study; hence there is little evidence from psychotherapists as to the extent to which specific emotional states lead to accidents. Other work on personality factors has focused on various presumably stable character traits in an attempt to develop a profile of the “safe” driver, pilot, machine operator, *et al.* But this approach has both practical and theoretical limitations. Although, for example, it is sometimes feasible for a military service, an industrial organization, or a common carrier to use this type of psychological screening in personnel selection where it is

possible to reject large percentages of individually safe applicants whose characteristics cannot be differentiated from those of groups with elevated rates, it is extremely doubtful that the American public would countenance the use of personality tests as part of the driver licensing procedure, particularly since these tests currently show little reliability in predicting *individual* accident experience.⁶ Perhaps more seriously limiting is the fact that this research usually: (1) omits adequate scrutiny of variations in the exposure to hazard of those studied; (2) has failed to discriminate between characteristics that are stable in time and those that are transient or situational; (3) does not attempt to verify its results by replication with other populations; and (4) does not demonstrate that the percentages of individuals who would have to be restricted in order to achieve a given reduction in accidents makes psychological screening sufficiently "economical" to be politically and socially acceptable.⁶

A related and particularly dangerous misuse of psychological approaches is to justify in a logically circular fashion administrative actions against individuals who, for whatever reason, have been involved in repeated accidents. In the present state of our knowledge, we cannot reliably attribute an individual's accident history to his psychological characteristics, and hence there are no grounds for basing administrative action upon psychological theory or for attempting to validate psychological hypotheses on the basis of administratively accumulated accident histories. As Daniel P. Moynihan has pointed out:

It is particularly to be noted that the administration of traffic laws has generally ignored the statistical laws that govern the random distribution of comparatively infrequent events among a large number of persons. (There is only one fatality for 2000 years of average driving experience.) These laws dictate, of course, that a rather large share of the events will occur to a rather small portion of the group. This raises the possibility, even the likelihood, that many of the "persistent violators" of the traffic laws are innocent victims of the Poisson distribution whose misfortunes have been compounded by a statistically illiterate bureaucracy.⁷

Another obstacle to productive psychological research stems from the fact that, unlike many other kinds of human behavior, risk-taking or the precipitation of accidents cannot usually be elicited or effectively simulated under laboratory conditions. The kind of risk-taking behavior that can easily be studied in the laboratory consists essentially of the calculation of probability and the alteration of decision-making by various social processes. But such laboratory behavior may lack the spontaneity, the motivation, the social climate, the "punishment," and many other elements that influence risk-taking and accident precipitation in a natural setting. This raises again a point emphasized in Chapter 3—namely, the importance of studying accidents and their related phenomena in the real world in which they occur and not merely under the necessarily artificial conditions of the laboratory.

The readings selected for this chapter reflect in many ways the points we have made in the foregoing discussion. In general, their value lies more in the potentials they point to than in the excellence of their methodology or the validity of their conclusions. Thus, they are more useful in pointing out general directions for further and more rigorous research than in providing findings that can be used as a firm basis for action programs.

PSYCHOANALYTIC APPROACHES

Freud's emphasis on the role of subconscious factors in what he termed "the psychopathology of everyday life" has had wide influence among research workers and especially among laymen concerned with accidents. The method employed for demonstrating the importance of such factors in accident causation has, however, progressed but little since Freud's work.

PARAPRAXES AND WIT

- Charles Brenner, M.D.

It is not the purpose here to discuss the adequacy of the scientific evidence underlying psychoanalytic theory. However, it must be pointed out that its applications to accident causation have yet to be substantially supported by the rigorous and systematic research that is regarded as essential in collateral fields. The evidence cited, which is essentially anecdotal, is usually derived post hoc under conditions which might be expected selectively to favor the production and reporting of information compatible with the conceptual framework employed. Case series have been statistically highly selected. Controls have been virtually nonexistent. The data have seldom been validated even when independent sources have been available. Psychoanalytic interpretations have been favored to the exclusion of alternative explanations. This is not to deny the considerable likelihood that some accidents are initiated by psychodynamic factors or to suggest that the theories themselves are incorrect. Rather, it is to point out the weaknesses of the research evidence supporting the presumption that such factors contribute to accidents. These characteristics are well illustrated by the selection that follows.

LET US NOW CONSIDER the class of parapraxes which are ordinarily referred to as accidental mishaps, whether the mishap occurs to oneself or to another as the result of one's own "carelessness." We must make it clear at the outset that the only accidents with which we are here concerned are those which the subject caused by his own actions, although he had, of course, no *conscious* intention to do so. A mishap which is beyond the subject's control is of no interest to us in our present discussion.

It is often easy to decide whether the subject was responsible for the mishap under consideration, but it is by no means always such a simple matter to do so. For example, if we are told that someone

was struck by lightning during an electrical storm, we should ordinarily be quite confident that the mishap was truly accidental and could not possibly have been unconsciously intended by the victim. After all, who can tell where lightning will strike? However, if we learn that the victim was sitting under a tall, solitary tree next to a heavy, steel chain that dangled from one of the branches to within a few feet of the ground, then we might as well begin to wonder whether the victim was or was not aware, before the accident, of the relatively great danger that a person in such a situation will in fact be struck by lightning. If we then discover that this was well known to the

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victim and if, having recovered from his mishap, he honestly disclaims any conscious intent to endanger his life, we must conclude that this particular victim of lightning was deliberately, though unconsciously, trying to get it to strike him. In the same way, an automobile accident may be due to a purely mechanical failure and have nothing whatever to do with the driver's unconscious intent, or it may, on the other hand, have been either directly caused or made possible by unconsciously intentional acts of commission or omission by the driver.

The reader may ask whether we propose the view that every mishap that *could* have been caused or facilitated by an unconscious intent on the part of the subject was in fact so caused. Is there to be *no* room left for human imperfection? Are we to assume, for instance, that no one would ever have an automobile accident unless he unconsciously wanted to?

The answer to this question is, in principle, an unequivocal one. Insofar as a foreseeable mishap is caused by a "human imperfection" in the performance of some action or other, we assume that it was unconsciously intended by the performer of that action. It is true, of course, that fatigue, boredom induced by monotony, and other, similar factors may increase the frequency of such mishaps to a greater or less extent, but we are here in the same position as that which we took with respect to slips of the pen or tongue. The necessary condition for a mishap of this sort, which is often a sufficient condition as well, is an unconscious intent to produce it. Fatigue, boredom, etc., are merely accessory or adjuvant factors.

If the reader now asks how we can be so sure that mishaps within the control of the subject were in fact unconsciously produced by him, our answer must be that this conclusion is a generalization which has been made on the basis of those cases of such mishaps which have been accessible to direct study. Here again, as in the case of other parapraxes, direct study means the application of the psychoanalytic technique. If the subject's cooperation can be obtained, his associations

will lead to an understanding of his unconscious motives for causing the mishap that seemed at first glance to be quite accidental. It happens not infrequently that, in the course of the analysis of such a mishap, the subject recalls that he knew for a moment that the "accident" was going to happen, just *before* he performed the action that produced it. Obviously, he could know such a thing before the fact only if he intended that it should happen. This partial awareness of intent is usually repressed, that is, forgotten, during or just after the mishap and is only restored to conscious memory if the mishap is analyzed. Thus, without analysis the subject himself usually is quite convinced of the purely accidental nature of the mishap that in fact he himself intentionally caused.

Naturally it is in the course of psychoanalytic therapy that the opportunity arises most often for studying such mishaps directly, as opposed to merely speculating about them in a more or less convincing way on the basis of external, circumstantial evidence. Most of our examples will consequently be drawn from this source, though such mishaps are by no means more frequent in the lives of psychoanalytic patients than they are in the lives of other persons.

On one occasion a patient, while driving to work, was making a left turn at a fairly busy intersection. Because of the number of pedestrians who were crossing, he had slowed to a speed of about five miles an hour when he suddenly struck an elderly man with his left, front fender and knocked him to the ground. As far as the patient was aware when he first told the story of the mishap, he had not seen the man at all. Later, however, he was able to recall that he was not surprised when he felt his car hit something. In other words, he was dimly aware of his unconscious intent to strike the man with his fender at the moment of the "accident." On the basis of his associations to the various circumstances of what had happened it was possible to discover that the chief, unconscious motive for the mishap was the patient's wish to destroy his father. In fact, his father had been dead for a number of years,