PERSONALITY FACTORS IN ACCIDENT CAUSATION

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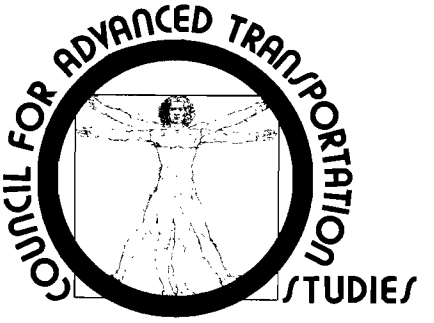

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PERSONALITY FACTORS IN ACCIDENT CAUSATION

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16. Abstract

This report reviews the literature on the association of personality traits and accidents. The personality of the accident repeater is reviewed. In general, aggression seems to be a critical link between alcoholism, depression, patterns of reaction to stress, the theory of the accident process, suicide and accidents. However, the research in this area has often been criticized, and countermeasure development to deal with complex psychological forces will be difficult. Rather than view an accident as an isolated event, researchers now propose that accidents are preceded by a number of often recognizable signs which indicate stress, anxiety, and conflict. It may be possible to develop intervention strategies which short circuit the accident process.

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EXECUTIVE SUMMARY

Researchers[1] suggest that "man drives as he lives," and that those having difficulty with the personal and social demands of living will tend to make repeated driving errors. The term "accident proneness" was proposed in the 1920's to account for the disproportionate distribution of accidents among drivers with similar exposure. Several authors[2] report that a large number of accidents involve a relatively small number of drivers but these results are not supported by others[3] who have failed to support the "accident proneness" concept. Subsequent theories were proposed such as those of Shulzinger[4] and McGuire.[5] The former proposed a shifting group of accident repeaters and the latter distinguished between short-term and long-term accident proneness.

Generally, the studies indicate that "long-term" repeaters are characterized by aggressiveness, impulsiveness, depression, anxiety and extroversion. Although the evidence at this date is tenuous, there does seem to be a certain consistency in the traits described as accident related when personality differences are identified. The short-term accident repeater has been described as possibly suicidal and self-destructive or undergoing temporary life stresses or undergoing an "accident process." These more recent theories suggest that transient life stresses cause personality deterioration in individuals and thus lead to accident behavior.

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[1] R. A. McFarland, "The Psycho-Social Adjustments of Drivers in Relation to Accidents," Police, (January-February 1966), p. 1; M. P Feldman, "Man Drives as He Lives - Psychological Factors in Road Accidents," Automobile Engineer, (December 1967), pp. 508-509.

[2] H. M. Johnson, "Biographical Methods of Deterring Accident Prone Drivers," Psychological Bulletin, 35 (1938), pp. 511-512; A. Crancer, Jr., "Involvement of the Problem Driver in Motor Vehicle Accidents," Traffic Quarterly, 21 (1967), pp. 601-610; G. H. Whitlock, et al., "Predicting Accident Proneness," Personnel Psychology, 16, No. 1 (1963), pp. 35-44.

[3] R. A. McFarland and R. C. Moore, "Accidents and Accident Prevention," Annual Review Medicine, 13 (1962), pp. 361-388; A. Burg, "The Stability of Driving Records Over Time," University of California Public Institute Transportation Engineering, 2, No. 1 (1970), pp. 57-65.

[4] M. S. Shulzinger, "Accident Syndrome," Archives Industrial Hygiene Occupational Medicine, 10 (1954), pp. 426-433.

[5] F. L. McGuire, "A Typology of Accident Proneness," Behavioral Research in Highway Safety, 1, No. 1 (1970), pp. 26-32.

There is support in the literature for higher levels of stress preceding accidents. One study reports that traffic offenders have significantly higher numbers of adverse life events occurring to them within four weeks prior to their offenses (as compared to controls).[6] The theory of the "accident process" assumes that the moment of injury is not an independent event. Rather an accident has a history. Preaccident behavior (studied in an industrial setting) has been shown to include: (1) making simple mistakes not usually made, (2) breaking safety rules not usually broken, (3) making several safety infractions (in a series) during a short time period, and (4) predicting one's own injury. The theory is that the accident allows individuals to convert their depression to anger.[7]

It is interesting, therefore, that theories of suicide are consistent with the previous theories and that suicide has been linked to accident statistics. Freud's theory of suicide also involves aggression -- aggression turned inward as punishment for unbearable guilt. One study reports increased alcohol consumption two days prior to suicide attempts. Thus, depression, alcoholism, aggression, suicide and accidents seem to be somehow linked and possibly have roots in earlier patterns of development associated with inadequate parenting and poor or conflicting relationships with authority. However, it should be remembered that even the most well-adjusted persons are not uniformly mentally healthy at all periods in their lives. Given the appropriate stressors most individuals might be subject to the "accident process." At this time it seems probable that some unknown but sizable proportion of traffic accidents can be linked to the psychological preaccident patterns or forces described above.

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[6]C. L. Williams, A. S. Henderson, and M. Mills, "The Personality and Mental Health of Serious Traffic Offenders," U. S. National Highway Traffic Safety Administration Report, No. SM - 2-e, (1973), p. 11.

[7]A. H. Hirschfeld and R. C. Behan, "The Accident Process: I. Etiological Considerations of Industrial Injuries," The Journal of the American Medical Association, 186 (1963), pp. 193-199.

Post-accident patterns have also been studied. Hirschfeld and Behan[8] argue that accidents allow individuals to transform depression and anxiety into rage and indignation which functions to resolve emotional conflict. Hodge[9] discussed the whiplash injury in terms of this hypothesis. The accident allows the patient to focus on physical rather than psychological symptoms thus relieving anxiety. There are secondary gains of accidents including personal and financial benefits which lead to resistance to treatment.

Personality factors also seem to complicate prevention efforts. Rainey and Conger[10] report that voluntary driver's education students have personalities different (less accident generating) from those not choosing to enroll in driver's education. Research in industry[11] suggests that the attitude of supervisors toward workers and supervisor knowledge of worker's personalities and capacities is critical to safety. Though some support educational interventions, other experts in the field believe that better design of the road-use environment, taking into account "human frailty," is the more productive route to accident reduction.

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[8] A. H. Hirschfeld and R. C. Behan, "The Accident Process: III. Disability: Acceptable and Unacceptable," Journal of the American Medical Association, 197, No. 2 (1966), pp. 85-89.

[9] J. R. Hodge, "The Whiplash Injury: A Discussion of this Phenomenon as a Psychosomatic Illness," Ohio State Medical Journal, 60, No. 6 (1964), pp. 762-766; J. R. Hodge, "The Whiplash Neurosis," Psychosomatics, 12, No. 4 (1971), pp. 245-249.

[10] V. Rainey, J. J. Conger, and C. R. Walsmith, "Personality Characteristics as a Selective Factor in Driver Education," Highway Research Board Bulletin, 285 (1961), pp. 23-28.

[11] A. Cohen, M. Smith, W. Kroes, and B. Johnson, "Mental Emotional Factors Contribute to Job Safety," International Journal of Occupational Health, 44, No. 5 (1975), pp. 32-37; C. E. Willhite, "The Corrective Therapist in the Industrial Safety Setting," American Corrective Therapy Journal, 27, No. 1 (January-February 1973), pp. 24-27.

PREFACE

This is the second in a series of research reports describing activities and findings on accident research as part of the work conducted by the Council for Advanced Transportation Studies at The University of Texas at Austin under the auspices of the Texas Office of Traffic Safety, State Department of Highways and Public Transportation.

This report is concerned with the association of personality traits and accidents.

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I. INTRODUCTION

By definition, an accident is a happening that is determined by chance. The frequency of accidents, therefore, should be determined by the risk inherent in the activity and/or the situation and should be reflected in a pattern established for chance happenings. When a frequency distribution for accidents is analyzed, there are a number of individuals who have a greater proportion of accidents than can be explained by chance alone.[1]

Crancer[2], for example, found that the involvement ratio of accidents increased steadily as the driving record became poorer. He found that significantly more drivers with poor records were involved in accidents ($p < .001$). Crancer calculated that an individual with nine or more traffic violations had a 1:700 chance for an accident, whereas an individual with no violations had a 1:2700 chance for an accident. McFarland[3] states that the "most significant biographical predictors appear to be a history of previous accidents which suggests the presence of an accident syndrome or habit."

Several researchers[4] suggest that "man drives as he lives;" that is, if he repeatedly makes mistakes in adjusting to personal and social demands of living, he will make repeated errors in driving. Turfboer[5], however, speculates that driving is a form of expressive behavior; that is, an individual driver "acts out" an unconscious conflict.

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[1] U. S. Congress, "Motor Vehicle Traffic Conditions in the U. S., the Accident Prone Driver," House Document, No. 462, Part VI, Washington, D. C., Government Printing Office, p. 110; Crancer, A., Jr. and D. Quiring, "The Mentally Ill as Motor Vehicle Operators," American Journal of Psychiatry, 126 (1969), pp. 807-813.

[2] A. Crancer, Jr., "Involvement of the Problem Driver in Motor Vehicle Accidents," Traffic Quarterly, 21 (1967), pp. 601-610.

[3] R. A. McFarland, "The Psycho-Social Adjustments of Drivers in Relation to Accidents," Police, January-February (1966), p. 1.

[4] Ibid., p. 1; M. P. Feldman, "Man Drives as He Lives - Psychological Factors on Road Accidents," Automobile Engineer, December (1967), pp. 508-509.

[5] R. Turfboer, "Do People Really Drive as They Live?" Traffic Quarterly, 21 (1967), pp. 101-108.

In any case, the research has continued to identify the accident repeater as suicidal and/or self-destructive, undergoing some recent or current life stress, or involved in an "accident process" or, more specifically, as aggressive, impulsive, psychotic, non-psychotically ill, depressed, anxious, and extroverted.

The literature that follows has been divided into four general categories as it relates to accidents: (1) personality factors, (2) life stress, (3) the accident process, and (4) self-destruction and suicide.

II. PERSONALITY FACTORS

The term accident proneness is the name for a concept which was proposed by psychological researchers of the 1920's. Proponents of the Accident Proneness Model hypothesize that personality traits rather than individual differences in psychomotor ability determine which individuals are involved in accidents when the exposure to risk is equal. These traits are of equal importance in all situations where accidents may occur, the implication being that a comparatively small group of individuals is responsible for the majority of accidents. Johnson[1], for example, analyzed the records of 30,000 drivers and found evidence that nearly 40 percent of all accidents in his population were caused by less than four percent of the drivers. Crancer[2] supports this, as discussed earlier, as do Whitlock, et al.[3] Findings by others, however, have not been as strongly suggestive of accident proneness. McFarland and Moore[4], for example, have been unable to demonstrate the reliability of the concept of accident proneness in their evaluation of accident repeaters. Burg[5] found that the vast majority of accidents which occurred during a three-year period involved drivers who had been accident free during the previous three-year interval.

This unsupporting research led to subsequent theories in an attempt to verify the existence of an accident-prone syndrome. Shulzinger[6] proposes that the makeup of a small group of accident repeaters is constantly shifting over

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[1] H. M. Johnson, "Biographical Methods of Deterring Accident Prone Drivers," Psychological Bulletin, 35 (1938), pp. 511-512.

[2] A. Crancer, Jr., "Involvement of the Problem Driver in Motor Vehicle Accidents," Traffic Quarterly, 21 (1967), pp. 601-610.

[3] G. H. Whitlock, et al., "Predicting Accident Proneness," Personnel Psychology, 16, No. 1 (1963), pp. 35-44.

[4] R. A. McFarland and R. C. Moore, "Accidents and Accident Prevention," Annual Review Medicine, 13 (1962), pp. 371-388.

[5] A. Burg, "The Stability of Driving Records Over Time," University of California Public Institute Transportation Engineering, 2, No. 1 (1970), pp. 57-65.

[6] M. S. Shulzinger, "Accident Syndrome," Archives Industrial Hygiene Occupational Medicine, 10 (1954), pp. 426-433.

a period of time, with persons dropping out of the accident group and other persons continually coming in. McGuire[7] differentiates between short-term and long-term accident proneness. He defines the short-term accident-prone individual as one who is either undergoing stress or a serious situation which is stressful (divorce, financial burdens, etc.), which he calls crisis reaction, or having reactions to transient conditions (illness, fatigue, etc.). McGuire defines long-term accident proneness as a result of character conditions (aggressive, disrespectful, etc.), intra-psychic conditions (neurotic, psychotic), or physical conditions. McGuire feels that unless one distinguishes between these two groups, research will be unreliable.

Short-term accident proneness or life stress is the focus of a later section of this report. Discussion of the research describing long-term accident proneness which involves character conditions or intra-psyhic conditions follows.

Some of the personality variables relating to accident proneness which have been isolated and tested include aggression, impulsiveness and weak inner controls, depression and guilt, anxiety and suspiciousness. Observations have also been made with regard to the neuropsychiatrically ill individual in relation to accidents.

Many researchers speculated and tested the hypothesis that aggressiveness as a personality characteristic increases the chance of accidents. Conger, et al.,[8] compared two groups of Colorado subjects: a high accident group with two or more accidents (N=10) and an accident free group (N=10). Conger and his associates used psychiatric interviews and psychological tests (Thematic Apperception Test, Wechsler, Rorschach, Sack Sentence Completion Scale). In each case the psychologist prepared a general evaluation of the subject with particular reference to overall assets and liabilities, basic character traits, and

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[7] F. L. McGuire, "A Typology of Accident Proneness," Behavioral Research in Highway Safety, 1, No. 1 (1970), pp. 26-32.

[8] J. J. Conger, et al., "Psychological and Psycho-physiological Factors in Motor Vehicle Accidents: A Follow-Up Study," Journal of the American Medical Association, 169, No. 14 (1959), pp. 1581-1587.

defense mechanisms used. The conclusion after rating this information on 13 independent variables was that the high accident sample showed a statistically significant tendency: (a) to have less capacity for managing or controlling hostility, (b) to be either excessively self-centered and indifferent to the rights of others or excessively sociocentric, (c) to be either excessively preoccupied with fantasy satisfaction or extremely stimulus-bound, (d) to be more fearful of loss of love and support and, (e) to be generally less able to tolerate tension without discharging it immediately.

Finch, et al.[9], concluded in their study after an "intensive investigation" (case studies) of 28 consecutive auto fatalities in Houston, Texas, that there was more uncontrolled anger, poor impulse control, and depression among these individuals than was found in the general population. They also found that 57 percent were in interpersonal or sexual conflict. In Baltimore County, Maryland, Horn[10] reviewed Schaffer's research at Johns Hopkins University School of Medicine. His study compared two groups of 50 men each by inspecting medical examiner reports, police records, and motor vehicle records and interviewing close relatives and friends. He found that the men involved in fatal accidents were more belligerent, verbally expansive and negative than the men who had no accidents.

In Schaffer's[11] study of male driver fatalities in Baltimore County, Maryland, he concluded that the involved men were more belligerent and negative. Schaffer stated that "a constellation of traits or states characteristic of a person at a given point in time predispose him to an increased likelihood of an accident." Schaffer's method of evaluating his subjects included physical autopsy, inspection of accident site and vehicles, investigation of police reports and motor vehicle records, psychological interviews with relatives, friends and informants, and responses on the KATZ Adjustment Scales (Form R)

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[9]R. Finch, et al., "Sexual Conflict and Reckless Driving," Sexual Behavior, May (1972), pp. 54-55.

[10]J. Horn, "Profile of Fatally Injured Drivers," Psychology Today, 8, October (1974), p. 35.

[11]H. R. Schaffer, "Behavior Under Stress: A Neurophysiological Hypothesis," Psychological Review, 61 (1954), pp. 323-333.

that permit a retrospective quantitative description of the subject. Rapp[12] theorized that the individuals who seem to account for a high proportion of accidents are passive-aggressive. He described these individuals as having a high inherent level of aggression, aggression that is rarely discharged through socially acceptable outlets. Indeed, appropriate outlets are avoided by these individuals and they are sullen, stubborn, and procrastinating, show increasing inefficiency, and are obstructionist in their tactics. Shere[13] studied male drivers in the Israel Defense Force (ages 18-21). Group A had no driving offenses or accidents (N=23), Group B had driving offenses but no accidents (N=31), and Group C had driving offenses and accidents (N=32). Using the Study of Values Scale, the Ascendancy Submissiveness Test, the Picture Frustration Test (Rosenzweig), and a questionnaire, Shere found some tentative evidence that the "no violations/no accident" group was high in aggression internalization, whereas the "violation/accident" group was high in aggression/revelation (projected aggression).

Thus, there appears to be some tentative support for the idea that aggression plays a part in accident-proneness despite the researchers' speculative natures, lack of a control for miles driven, and small samples. However, there are studies which refute these results. Davis and Coiley[14] compare two groups of subjects from the city of Cambridge: the accident group each had three or more accidents per 100,000 miles of driving (N=34) and the safe group each had less than three accidents per 100,000 miles of driving (N=74). Depending primarily on the driver's experience, personal history, medical information, and attitude measures, Davis and Coiley found no relation between personality factors (anxiety, aggression, etc.) and accidents.

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[12] M. S. Rapp, "A Psychiatrist's View of the Human Factors Involved in Safety Planning," American Society of Safety Engineers Journal, 17 (1972), pp. 26-31.

[13] E. S. Shere, "Psychological Aspects and Motor Vehicle Accidents," U. S. National Highway Traffic Safety Administration Report: No. SM-2, Washington, D. C.: National Highway Traffic Safety Administration, 1973, pp. 1-11.

[14] D. R. Davis and P. A. Coiley, "Accident Proneness in Motor Vehicle Drivers," Ergonomics, 2 (1959), pp. 239-246.

Williams, et al.[15], compared serious traffic offenders (N=100) and a control group (N=99) in Australia during a six month period beginning September 1, 1971, and found no support for the relationship between accidents and hostility. The instruments used to evaluate subjects included (1) an item sheet containing questions on socioeconomic status, educational level, driving experience, sociobehavioral variables and exposure to recent adversity, (2) the standard progressive matrices test which measures nonverbal intelligence, (3) the Cattell 16-Personality Factor Test, (4) a general health questionnaire, (5) a hostility and direction of hostility questionnaire, and (6) the Eysenck Personality Inventory.

Cohen, et al.[16], also, in their study of two groups of 60 subjects, found no significant differences with regard to impulsiveness, emotional stability, and activity level, as measured by standard personality and intelligence tests, an interview questionnaire, and a pictorial projective test.

Another cluster of personality traits which researchers have hypothesized are related to accidents include individuals high in anxiety, suspiciousness or hyposensitivity.

Andersson, et al.[17], studied one group of young (age 20-27 years) male drivers with a high record of traffic damages (N=22) and the same number of accident-free control subjects in the province of Skane, Sweden. An interview and a test of complex psychomotor coordination was involved in the investigation. The authors designed an apparatus which was a modified dentists' chair rigged to simulate driving conditions and to record performance in a 16-minute experiment. Andersson reported that subjects with high traffic damages were significantly more hyposensitive to intraceptive perception (had short-term awareness and thus were extremely dependent on the environment for cues) ($p<.001$) as compared with the control group. They also concluded that this group was

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[15]C. L. Williams, et al., "The Personality and Mental Health of Serious Traffic Offenders," U. S. National Highway Traffic Safety Administration Report, No. SM-2-e, Washington, D. C.: National Highway Traffic Safety Administration, 1973, pp. 1-11.

[16]A. Cohen, et al., "Mental, Emotional Factors Contribute to Job Safety," International Journal of Occupational Health, 44, No. 5 (1975), pp. 32-37.

[17]L. Andersson, et al., "Personality Differences Between Accident-Loaded and Accident-Free Young Car Drivers," British Journal of Psychology, 61, No. 3 (1970), pp. 409-421.

characterized by dependence on its environment, resulting in a delay of action.

In another study, Fergenson and Johnson[18] evaluated 20 subjects categorized in the following manner:

(1) high accident (three or more accidents/no violations, N=5)

(2) high violation (three or more violations/no accidents, N=5)

(3) high accident/high violation, N=5)

(4) control (no accident/no violations, N=5)

The subjects were volunteers from the faculty and staff of Stevens Institute of Technology. All four groups were given the Minnesota Multiphasic Personality Inventory, the Cattell 16-Personality Factor Test and the McGuire Driver Attitude Scale.

The authors concluded from their results that the high accident/high violation group were significantly more suspicious, i.e., mistrusting and doubtful; self-opinionated; unconcerned about others; and poor team members ($p < .05$) than the control group. They concluded that the accident-prone were more alert and more frustrated, whereas the violation-prone were careless of protocol, followed their own urges, and were more worried and troubled. Fergenson and Johnson believe that high anxiety causes a decrement in performance.

Davis and Coiley's[19] research, cited earlier, refutes Fergenson and Johnson's results; Davis and Coiley found no relationship between anxiety and accidents.

Crancer and Quiring[20] studied the driving records of 271 individuals who were admitted to King County Hospital, Seattle, Washington, in 1964 and were diagnosed as having a psychotic, psychoneurotic or personality disorder as compared with the driving records of 687,228 then currently licensed drivers in King County. These researchers reported that those individuals diagnosed as having a psychoneurotic or personality disorder had statistically higher accident

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[18] P. E. Fergenson and J. M. Johnson, The Problem Driver: Personality and Demographic Variables, Report 1317, Hoboken, New Jersey: Davidson Laboratory, Stevens Institute of Technology, September (1968), pp. 1-14.

[19] D. R. Davis and P. A. Coiley, op. cit., pp. 239-246.

[20] A. Crancer, Jr. and D. L. Quiring, op. cit., pp. 807-813.

rates and had a higher proportion of drunken driving, reckless driving, hit and runs, negligent driving and defective equipment. The psychotic patients did not differ from the control group in any way except that they had a higher violation rate than the control group.

Buttiglieri and his associates have made extensive studies of patients admitted to psychiatric hospitals with respect to their driving records. The subjects of one study by Buttiglieri and Guenette[21] were admitted to neuropsychiatric wards at the Sepulveda (California) Veteran's Administration Hospital during a three-year period (August, 1964 - July, 1967) who had current California driver's licenses at the time of admission (N=361). Buttiglieri and Guenette found that the frequency of accidents and driving violations for the patient group did not differ significantly from a comparison group of male California drivers. However, a trend was noted: more accidents and driving violations did occur immediately preceding hospitalization than in those months further removed. In a following study of the same but earlier sample (N=533) Buttiglieri, et al.[22], reported that 78 percent of the patients had no accidents and 62 percent had no more than one violation in the three years preceding hospitalization. Comparable figures of a random sample of male California drivers (N=36,717) indicated that 79 percent had no more than one violation. No statistical difference between groups was found for accidents; however, the neuropsychiatric group had a higher ($p < .001$) violation record than the comparison group.

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[21] M. W. Buttiglieri and M. Guenette, "Driving Record of Neuropsychiatric Patients," Journal of Applied Psychology, 51, No. 2 (1967), pp. 96-100.

[22] M. W. Buttiglieri, et al., "Driver Accidents and the Neuropsychiatric Patient," Journal of Consulting and Clinical Psychology, 33, No. 3 (1969), p. 381.

Buttiglieri and Guenette's[23] earlier study of a similar, but smaller population (N=165) of patients found no difference with regard to either accident or violation rate as compared with the general driving population. Buttiglieri and Guenette feel that it does not necessarily follow that the licensee who acquires the label "mentally ill" constitutes a major highway menace. However, they also state that a separate study of personality types may be an alternative approach.

Several additional personality traits have been identified by researchers as possibly relating to increased occurrence of accidents. With the exception of extroversion and its hypothesized relationship with accidents, neither further confirmation nor refutation seems to appear in the literature.

Bernard Fine[24] postulated that since extroverts are assumed to be less socialized than introverts, it is reasonable to assume that they should be less bound by the prescribed rules of society regarding motor vehicle operation. Therefore, it was hypothesized that they would incur more traffic accidents and violations than introverts. Fine's subjects were male, freshmen, Minnesota residents in the General College of the University of Minnesota in 1951, 1952, and 1953 (N=993) who were administered the MMPI at the time of admission and whose driving records were available at the Minnesota State Highway Department. Particular attention was given to the results on the MMPI. Traits highest on introversion included depression, headache, irritability and somatic anxiety. Traits with highest loadings on extroversion were hysteria and sexual anomalies.

Evaluation of the MMPI resulted in three groupings of subjects: introverts (N=319), extroverts (N=298), and an intermediate group (N=320). Fine found significant differences between extroverts and introverts with regard to accidents ($p < .01$) and numbers of violations ($p < .02$) in the predicted

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[23] M. W. Buttiglieri and M. Guenette, "Temporal Relationship Between Automobile Accident and Psychiatric Hospitalization," Perceptual and Motor Skills, 24 (1967), pp. 1327-1332.

[24] B. J. Fine, "Introversion-Extroversion and Motor Vehicle Driver Behavior," Perceptual and Motor Skills, 12 (1963), pp. 95-100.

direction. Further analysis revealed that introverts were not different from the intermediate group for accidents and number of violations; however, the extrovert group differed from the intermediate group with respect to accidents ($p < .01$).

Craske[25] also investigated the relation between introversion-extroversion and involvement in repeated accidents. Subjects were out patients attending a teaching hospital minor trauma clinic (N=100/70 men and 30 women) who suffered injuries from accidents not requiring hospitalization. In addition to providing general background information, each patient was asked to complete the EPI Form A. A significant positive correlation between accidents and extroversion for the male group was found.

FAMILY FACTORS

Tillman and Hobbs[26] postulate that intolerance of and aggression toward authority are personality traits which differentiate between high and low accident involvement. They speculate that the high accident record is one manifestation of these personality characteristics. To support this statement, Tillman and Hobbs studied 96 drivers with four or more accidents in the London district and found that 60 percent of this group was known to social and law enforcement agencies, other than for accidents, as compared with only 9 percent of a control group (N=100). In addition, these authors evaluated the personality characteristics of a group of London taxi drivers (N=40) which included drivers with both high and low accident records. A personal history covering parental background, childhood and adolescent history and adult adjustment was compiled through interviews. Information from the Public Juvenile Court and other social agencies was also obtained on the drivers. Tillman and Hobbs concluded from these data that the "high accident" taxi driver most frequently comes from a home marked by parental divorce and instability. During childhood his life is marked by evidence of instability and disrespect for organized authority. "As a result he has often encountered difficulty with the school

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[25] S. Craske, "A Study of the Relation Between Personality and Accident History," British Journal of Medical Psychology, 41, December (1968), pp. 399-404.

[26] W. A. Tillman and G. E. Hobbs, "The Accident-Prone Automobile Driver," American Journal of Psychiatry, 106, No. 5 (1949), pp. 321-331.

authorities and frequently has been before the Juvenile Court ... He has a police record apart from the traffic violations much more frequently than those within the low accident group....he is frequently known to various social agencies."

Willett[27] concurs with Tillman and Hobbs in his evaluation of 653 traffic offenders, who during a three-year period in London, caused death by dangerous driving, were driving while intoxicated, or were driving dangerously or while unlicensed. Of this group, Willett reported, one-fifth had criminal records and an additional 60 were known to the police as suspected or notorious individuals but had no criminal record. Willett concluded that the high offender has a general tendency to break rules.

DICHOTOMOUS THINKING

An interesting hypothesis has been proposed by Plummer and Das[28] with regard to the accident repeater's method of thinking dichotomously. Plummer and Das describe dichotomous thinking as "polarizing personality, relevant events, objects, meanings, attitudes, etc. in such a way as to experience them in their most extreme form....he cannot perceive that moderate chances are open to him." They conclude that the dichotomous thinker would make impulsive choices in favor of extreme actions.

To verify this hypothesis, Plummer and Das studied Psychology I students of the University of South Wales. Group I had frequent accidents (two or more accidents in the preceding 12 months, N=30). Group II had infrequent accidents (no accidents in the preceding three years, N=30). Osgood's Semantic Differential was used as the instrument for studying dichotomous thinking. The results of this study indicate that dichotomous thinking was used to a greater extent by the accident group ($p < .05$). The authors suggest that cognitive processes, i.e., how an individual perceives and organizes the world and how he relates to it, may be an area for further research.

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[27] T. C. Willett, Criminal on the Road, London: Tavistock Publications, 1964.

[28] L. S. Plummer and S. Das, "A Study of Dichotomous Thought Processes in Accident-Prone Drivers," British Journal of Psychiatry, 122, No. 568 (1973), pp. 289-294.

ULCERS

Smart and Schmidt[29] hypothesize that peptic ulcer patients differed from the Ontario general driving population in their frequency of motor vehicle accident involvement. The authors selected male peptic ulcer patients from a large urban hospital during January, 1956 to July, 1959 who held current driver's licenses (N=135). Peptic ulcer disease was chosen as a representative diagnosis of individuals experiencing psychosomatic illnesses. Official accident records were obtained on the subjects. Smart and Schmidt reported that the data indicated that peptic ulcer patients had significantly more accidents ($p < .05$) than the general Ontario driving population.

The authors, however, did not take into account subjects with high alcohol consumption rates nor speculate on other reasons for the results, such as driving while in physical discomfort or pain.

ALTERNATIVE THEORIES

Alternative theories regarding the causation of accidents other than single, identifiable personality characteristics have been proposed by several authors. Klein[30], for example, believes that many of the characteristics observed in the accident-liable individual are "group accepted and taught." This includes teaching children to be aggressive, competitive, self-reliant, risk-takers and thrill seekers. He concludes that the work and driving world is therefore in conflict with basic societal values.

Levinson[31] speculates that the place of work influences workers' attitudes and emotional states such that they may become ill or accident-liable. He refers to this as the "emotional toxicity of the work environment." With regard to accidents occurring at work, several researchers postulate

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[29]G. Smart and W. Schmidt, "Physiological Impairment and Personality Factors in Traffic Accidents of Alcoholics," Quarterly Journal of Studies on Alcohol, 30, No. 2 (1969), pp. 440-445.

[30]D. Klein, "Influences of Societal Values on Rates of Death and Injury," Journal of Safety Research, 24 (1971), pp. 44-53.

[31]H. Levinson, "Emotional Toxicity of the Work Environment," Archives of Environmental Health, 19 (1969), pp. 239-243.

that the pressures and perils of the work environment have a greater relationship with increased accidents than do personality factors.

CONCLUSION

Personality factors have been suggested by many researchers as a prominent cause of traffic incidents. Such personality traits as aggressiveness, belligerence, suspiciousness, anxiety, and extroversion have been examined as they relate to traffic accidents and violations. The driving records of individuals identified and labeled as mentally ill have also been examined to determine a relationship with poor driving performance. Although some support has been recorded for these hypotheses, the evidence is by no means clear-cut. Much research has shown no relationship between personality factors and poor driving performance. In addition, research in this area lacks the sophistication necessary for conclusions to be drawn. Using small samples and not controlling for mileage driven, hazardous mileage driven, etc., are serious weaknesses which need to be remedied before conclusions can be drawn.

III. LIFE STRESS

Many psychological factors have been isolated, discussed, and tested as researchers attempt to differentiate the accident repeater group from the non-accident group. A theory which receives consistent support throughout much of the research involves the accident-involved driver suffering psychological stress, anxiety or conflict very shortly before the accident. Several speculations are made concerning reasons why stress is related to accidents; for example, distraction and preoccupation[1], discharging of emotions[2], attention to interpersonal and ego identity issues, regression and indecision[3], and increased risk-taking.

However, it seems clear that recent stress is positively correlated with the occurrence of accidents. Brody[4] cites temporary stress responses as one of the three major causes of accidents. Marvin Osman[5] proposes that just prior to an accident's occurring, a large proportion of subjects face an imminent psychic transition in their lives. There is also evidence that accidents are preceded by an increased amount of tension. McGuire[6] states that, when the personal crisis is over, good adjustment returns, and the individual is no longer in an accident-prone period.

Schaffer[7] states that "psychological stress occurs when a highly motivated organism is unable to find an appropriate adjustive response to a problem

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[1] M. Henderson, "The Accident-Prone Car Driver - Does He Exist?" Medical Journal of Australia, 2 (October 30, 1971), pp. 909-912.

[2] L. Viney, "Accident Proneness: Some Psychological Research," Medical Journal of Australia, 2 (October 30, 1971), pp. 916-918.

[3] P. Osman, "A Psychoanalytic Study of Auto Accident Victims," Contemporary Psychoanalysis, 5 (1968), pp. 62-84.

[4] L. Brody, "The Accident Phenomenon," Personnel Administration, 26 (1963) pp. 11-14.

[5] Osman, op. cit.

[6] F. L. McGuire, "A Typology of Accident Proneness," Behavioral Research in Highway Safety, 1, No. 1. (1970), pp. 26-32.

[7] H. R. Schaffer, "Behavior Under Stress: A Neurophysiological Hypothesis," Psychological Review, 61 (1954), pp. 323-333.

confronting it." Thus, "psychological stress," Sleight comments[8], can be considered as that stress resulting from an individual's maladjustment to his life situation -- his 'life stress'."

Rahe, McKean and Arthur[9] developed a "Life-Change Units Scale" suggesting that these changes and the corresponding units directly reflect stress and onset of illness among male subjects (see Table 1).

Several studies have been conducted that confirm the hypothesis that increased life stress and life changes are related to the occurrence of accidents. Selzer and Vinoker[10], for example, demonstrated that life change and current subjective stress are significantly related to traffic accidents. They state that "life stress appears to be more important than the demographic, personality, and social maladjustment variables that have previously been the focus."

Alkov[11] reported in his research, that individuals with over 300 Life Change Units have more than a 70 percent chance of becoming physically ill or injured. Williams, Henderson and Mills[12] in their study of 100 serious traffic offenders as compared with a control group of 99 individuals found that the traffic offenders had significantly higher adverse life events within four weeks prior to the offense ($p<.001$) than the control group.

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[8] R. B. Sleight and K. Cook, Problems in Occupational Safety and Health: A Critical Review of Select Worker Physical and Psychological Factors, Vol. I, Cincinnatti, Ohio: U.S. Department of Health, Education and Welfare, November 1974.

[9] R. H. Rahe, J. D. McKean and R. J. Arthur, "A Longitudinal Study of Life Change and Illness Patterns," Journal of Psychosomatic Research, 10 (1967), pp. 355-366.

[10] L. Selzer and A. Vinoker, "Life Events, Subjective Stress, and Traffic Accidents," American Journal of Psychiatry, 131, No. 8 (1974), pp. 903-906.

[11] R. A. Alkov, "Psychological Profile," Approach, (1975), pp. 18-19.

[12] C. L. Williams, A. S. Henderson and M. Mills, "The Personality and Mental Health of Serious Traffic Offenders," U. S. National Highway Traffic Administration Report, No. SM-2-e (1973), pp. 11.

TABLE 1

LIFE-CHANGE UNITS SCALE

EVENTS	LCU
1. Loss of wife through death	100
2. Divorce	73
3. A lot more or a lot less than usual association with wife, due to marriage trouble	65
4. Held in a civilian jail or a brig	63
5. Loss of close family member by death	63
6. Marriage	50
7. Court-martial	47
8. A lot more or a lot less than usual association with wife, due to orders	45
9. Change in health or behavior of a family member	44
10. Major change in dating habits (engagement, etc.)	40
11. Major change in the situation of parents (divorce, etc.)	40
12. Gain of a new family member	39
13. A lot more or a lot fewer financial problems	38
14. Loss of close friend by death	37
15. Change to a new line of work, or a new type of work than done previously in the rating	36
16. A lot more or a lot fewer arguments with wife	35
17. Took on mortgage or loan greater than $10,000	31
18. Experienced a foreclosure on a mortgage or loan or received a letter of indebtedness	30
19. To a Captain's Mast for disciplinary reasons	30
20. Major change in responsibilities at work	29
21. A son or daughter married or moved out of the home	29
22. A lot more or a lot fewer in-law troubles	29
23. Personal successes	28
24. Either began or ceased attending high school or college	26
25. Wife started or stopped working outside the home	26
26. Substantial change in living conditions	25
27. Substantial change in personal habits	24
28. A lot more or a lot less trouble with superiors	23
29. Eligible for promotion but 'cut by quota' (enlisted) or 'passed over' (officer)	20
30. Changed high school or college	20
31. Change in residence	20
32. Substantial change in working hours or conditions	20
33. Substantial change in church activity	19
34. Substantial change in usual amount and/or type of recreation	19
35. Substantial change in social activities	18
36. Took on mortgage or loan less than $10,000	17
37. Marked change in sleeping pattern	16
38. Substantial changes in family get-togethers	15
39. Marked change in eating habits	15
40. Taking a leave or a vacation	13
41. Guilty of minor infractions of the civilian law	11

From R. H. Rahe, J. D. McKean and R. J. Arthur, "A Longitudinal Study of Life Change and Illness Patterns," Journal of Psychosomatic Research, 10 (1967), p. 355.

Selzer, Rogers and Kern[13] confirm these statistics, again, in a study of 96 individuals who were responsible for causing an auto fatality (n=96) as compared with a control group (n=96). They found that the group differed significantly with regard to vocational and financial stress ($p<.01$). Twenty percent of the drivers responsible for fatalities had emotional upsets six hours prior to the accident.

Although it is quite tempting to accept the existence of life stress as a major cause for accidents, several considerations must be evaluated. There are a number of differences, for example, in individual reactions to stress. These include biochemical individuality, early life experiences, psychological set, cultural factors, and unconscious and conscious mechanisms of defense and habitual methods of coping (McLean, 1972).[14] We may conclude, however, that there are "vulnerable" individuals who suffer from extreme stresses. It may be suggested that these men and women be placed in lower risk jobs or be warned and/or educated regarding the risk involved in driving during high stress times.

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[13] M. L. Selzer, J. E. Rogers and S. Kern, "Fatal Accidents: The Role of Psychopathology, Social Stress, and Acute Disturbance," American Journal of Psychiatry, 124, No. 8 (1968), pp. 1028-1036.

[14] A. McLean, "Occupational 'Stress': A Misnomer," Occupational Mental Health, 2, No. 4 (1972), pp. 12-15.

IV. ACCIDENT PROCESS

The concept of the "accident process" has been proposed by Hirschfeld and Behan[1] in several articles. They suggest that the moment of injury is not an independent event but, rather, an observable behavior that not only follows a period of conflict or anxiety, but also prefaces another set of emotions. Hirschfeld and Behan state:

> Before the accident occurs, there is a state of conflict and and anxiety within the patient. As a result, the worker finds a self-destructive, injury-producing act which causes his 'death' as a worker. From this moment on, the patient reacts exactly as do other psychiatrically-ill people except for the character of his symptoms. Instead of having a complaint of anxiety, depression or other classical psychiatric symptoms, he has the physical disorder which is the result of his accident.[2]

Hirschfeld and Behan[3] describe four events concerning this pre-accident behavior. They are: (1) the worker makes a "mistake" in her/his job that even a novice worker wouldn't make; (2) safety rules are broken which cause loss of worker protection; (3) several safety infractions are made within a short period of time; and (4) the worker may predict an injury will occur.

These men believe that the individual will become injured or maintain her/his symptoms to resolve conflict or stress without dealing with conflictual issues directly. They speculate that the injury allows these individuals' depressions to change into anger.

Hirschfeld and Behan[4] speculate that those individuals involved in the "accident process" have personality problems described as dependent, punishment

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[1] A. H. Hirschfeld and R. C. Behan, "The Accident Process: I. Etiological Considerations of Industrial Injuries," The Journal of the American Medical Medical Association, 186 (1963), pp. 193-199; A. H. Hirschfeld and R. C. Behan, "The Accident Process: III. Disability: Acceptable and Unacceptable," Journal of the American Medical Association, 197, No. 2 (1966), pp. 85-89; A. H. Hirschfeld and R. C. Behan, "The Accident Process: An Overview," Journal of Rehabilitation, 33, No. 1 (1967), pp. 27-31.

[2] Hirschfeld and Behan (1963), op. cit., p. 193.

[3] Ibid., p. 195.

[4] Hirschfeld and Behan (1967), op. cit., p. 28.

seeking, passive resistance, poorly identified personalities, depression or psychosis, all of which are unacceptable disabilities. Accidents, injuries or illnesses, however, are acceptable disabilities in our society. An example of Hirschfeld's and Behan's concept of the "accident process" is shown in Figures 1 and 2.

Pre-Accident

The accident is used to justify old behavior patterns. Thus, the pre-accident period or prodrome is characterized by evidence of depression or anxiety, emotional upheaval, carelessness, prediction of doom and a general feeling of discomfort. All of these symptoms, however, are unacceptable to the individual and to her/his community. The individual, also, is not able to or refuses to deal with the course of her/his discomfort. As an attempt to resolve the conflict, the individual ignores safety rules and may beg for help and become careless, which, Behan and Hirschfeld suggest, results in an accident. Physical problems caused by the accident are considered to be acceptable disabilities. Further denial of the original source of conflict is evidenced in the post-accident period (postdrome) by maintaining the physical symptoms or becoming reinjured.

Joseph Barmack[5] suggests in his study an inference for the pre-accident process. He suggests that single vehicle accidents are the result of primarily passive rather than active neglect and that the unconscious aim of the pre-accident behavior was more often tension-reducing than self-aggressive. Barmack supports his statement by his research concerning 138 airmen who were involved in automobile accidents which resulted in nonfatal injuries to the drivers of those automobiles. Barmack's findings indicated that the proportion of drivers who lost consciousness (fell asleep or passed out) while involved in single vehicle accidents was significantly higher ($p < .001$) than drivers who lost consciousness while involved in multiple vehicle crashes.

Hirschfeld and Behan[6] suggest that the identification of workers or drivers with troubled life situations and personality difficulties would aid

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[5]Joseph J. Barmack and Donald J. Payne, "Injury-Producing Private Motor Vehicle Accidents Among Airmen: Psychological Models of Accident-Generating Process," Journal of Psychology, 52 (1961), pp. 3-24.

[6]Hirschfeld and Behan (1967), op. cit.

FIGURE 1.

GENERALIZED ACCIDENT PROCESS

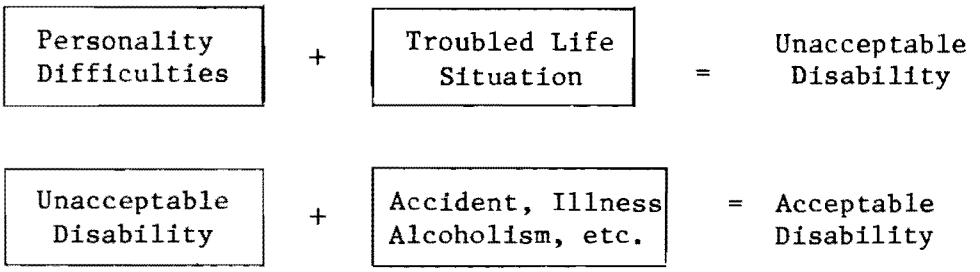
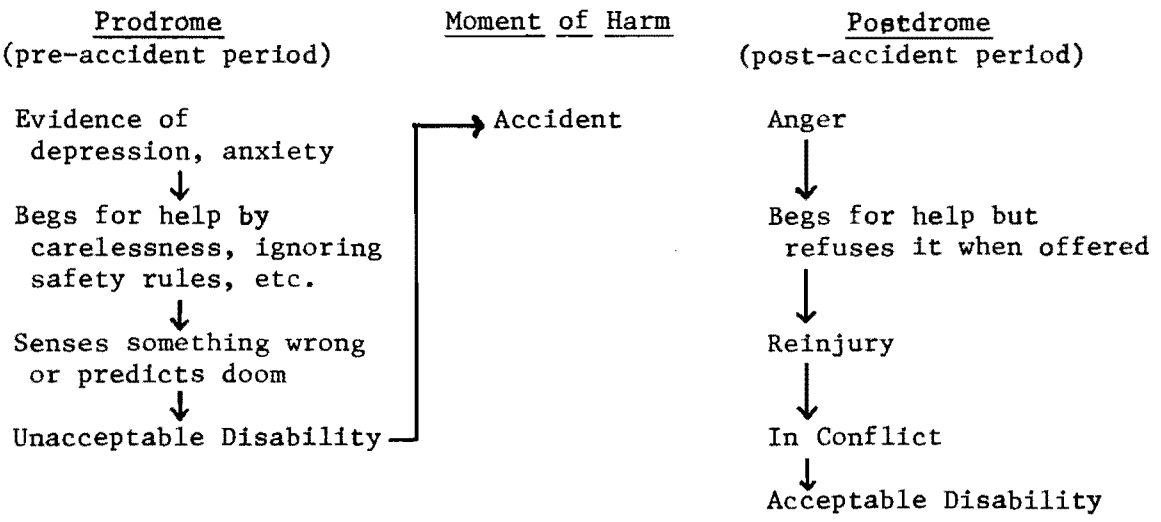


FIGURE 2.

ILLUSTRATIVE MANIFESTATIONS OF ACCIDENT PROCESS



Hirschfeld and Behan (1966)

in prevention of injury and/or fatalities in situations which would formerly have been attributed to accident.

Post Accident

Other researchers offer support of Hirschfeld and Behan's concept of the postdrome, or post-accident syndrome. Culpan and Taylor[7] studied 71 patients in a treatment clinic who had traffic- or industrial-related injuries. They reported that 41 percent of these individuals developed psychiatric symptoms within two weeks and 37 percent developed psychiatric symptoms within two months of the accident. Although they believed that one-third of the cases were a traumatic neurosis (overwhelmed by psychic threat but improved with time), one-half of the cases had potential financial gain and a primary preoccupation with the accident. This may be construed to offer limited support to Hirschfeld and Behan's hypothesis that depression and anxiety are transformed to rage and indignation, emotions symptomatic of a desire to maintain the physical disability rather than resolve the emotional conflict.

Hodge[8,9] discusses the whiplash injury as an activated, latent neurosis. Although he does not imply that the actual injury was consciously or unconsciously manufactured, he feels that the whiplash, as a traumatic neurosis, is manifested when an individual has a predisposition to neurosis prior to the accident and is undergoing current conflict. The accident (external precipitating stress) causes psychological reactions (anxiety, traumatic neurosis) immediately following the accident which are transformed to anger and feelings of being wronged. The patient's attention becomes focused primarily on the physical symptoms and this minimizes the psychological symptoms. Hodge further speculates that the primary gain (symptom forming factor) of the whiplash neurosis is partial control of anxiety. The secondary gain

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[7] R. Culpan and C. Taylor, "Psychiatric Disorders Following Road Traffic and Industrial Injuries," Australian and New Zealand Journal of Psychiatry, (1973), pp. 1-7.

[8] J. R. Hodge, "The Whiplash Injury: A Discussion of this Phenomenon as a Psychosomatic Illness," Ohio State Medical Journal, 60, No. 6 (1964), pp. 762-766.

[9] J. R. Hodge, "The Whiplash Neurosis," Psychosomatics, 12, No. 4 (1971), pp. 245-249.

(symptom fixing factor) may be financial or personal. These patients would therefore be resistent to treatment. Behan and Hirschfeld[10] concur. They believe that financial benefits for accidents, the attitudes of society and the law and the denied hostility of the medical doctor treating the resisting patient aid rather than deter this post-accident process.

Culpan and Taylor[11] suggest that psychological treatment referrals should be made early if large discrepancies exist between the severity of complaints and physical findings. Hodge[12] agrees that both physical and psychological methods be used conjointly to treat patients involved in the accident process. This, he suggests, would involve rapid psychiatric intervention and therapy directed at helping patients resolve conflicts, handle irrational fears and recognize and discharge anxiety appropriately. Behan and Hirschfeld[13] suggest that doctors be trained in recognizing these psychological symptoms and their own hostility toward the resisting patient and that they be educated in methods for handling and helping these different patients.

It must be noted, however, that the concept of the accident process is still in its theoretical and formative state. Little hard data and research are available to support this hypothesis.

In summary, the accident process has been suggested as a way of looking at traffic and industrial casualties. Researchers propose that, rather than being viewed as an independent and isolated event, the accident should be seen as being preceded by a number of often recognizable signs which indicate stress, anxiety and conflict. The accident is merely a method of resolving emotional turmoil. The period of time following the accident would also be indicative of the psychological conflict in that the individual is unwilling to aid in a speedy, accident-free recovery. Although no hard data and research are available, implications for accident prevention may include early recognition and intervention in the pre-accident period and new techniques and

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[10]Hirschfeld and Behan (1963), op. cit.

[11]Culpan and Taylor (1973), op. cit.

[12]Hodge (1964), op. cit.

[13]Hirschfeld and Behan (1963), op. cit.

psychological help in the post-accident period to aid in resolution of conflict.

V. SELF DESTRUCTION AND SUICIDE

Theoretically, suicide has its foundation with Freud's hypothesis that the suicidal individual turns sadism against her/himself as a necessary prerequisite to ridding the self of unbearable guilt.[1] Basic classifications of suicides are reported by Jackson to be, first, self-directed aggression; second, rebirth and restitution; and last, as a result of despair, loss of self esteem and/or a love object.

Various researchers have postulated that fatal or near-fatal accidents are the result of the suicidal or self-destructive urges of the individual vehicle driver, pedestrian or industrial worker. Tabachnick[2] defines self-destruction in his research as "an activity over which an individual has some (actual or potential) volitional control which moves him in the direction of an earlier physical death than would otherwise occur."

"Self destructive trends," states Alex Pokorny,[3] "are expressed through increased risk taking behavior, faulty vehicle maintenance, driving while intoxicated, driving while under emotional stress and so forth."

Most researchers in the area of accidents and suicides suggest that far more deaths are actually suicide-related than accidental. Selzer and Payne[4] believe that "the automobile lends itself to attempts at self-destruction due to the frequency of its use, the generally accepted inherent

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[1] D. D. Jackson, "Theories of Suicide," E.S. Schneidman and N. L. Farberow (eds.), Clues to Suicide. New York: Blackeston Division of McGraw-Hill Book Co., Inc., 1957.

[2] N.D. Tabachnick, "A Theoretical Approach to 'Accident' Research," Bulletin of Suicidology, National Institute of Mental Health, No. 6, 1970.

[3] A.D. Pokorny, "Self-Destruction and the Automobile," in A.R. Roberts (ed.) Self-Destructive Behavior. Springfield, Illinois: C.C. Thomas, 1975, pp. 123-137.

[4] M.L. Selzer and C.E. Payne, "Automobile Accidents, Suicide and Unconscious Motivation," The American Journal of Psychiatry, 119, No. 3 (1962), (p. 239).

hazards of driving, and it offers the individual an opportunity to imperil or end his life without consciously confronting himself with a suicide attempt."

The researchers postulate that a variety of suicidal personality traits, such as excessive conflict, depression, guilt, and past suicidal threats and attempts, account for a large proportion of what have previously been considered accidental deaths.

Schneidman[5] believes that many accidents are the result of subintentional deaths. The individual plays some partial, covert, subliminal or unconscious role in hastening her/his own demise.

Temoch, et al.[6] reported from a study of 1,457 suicides in Massachusetts that the risk of suicide in former mental patients in the first six months after leaving the hospital is 34 times greater than in the general population. MacDonald[7] confirms this in his study which reports that the incidence of fatal accident drivers that were in Colorado Psychopathic Hospital is over 30 times greater than expected.

The "psychological autopsy" has been used by researchers to evaluate the personality and psychological components of the deceased drivers held to be responsible for an automobile crash. The "psychological autopsy" involves the complete investigation of psychological and personality factors, a social history, health factors, an interviewer-respondent evaluation, and habit data, as well as indices of the fatally injured drivers' depressive-suicidal, sociopathic, homicidal, impulsive, paranoid or overtly psychotic tendencies. Drinking histories are taken, as well as the driver's involvement with various state and local agencies. Behavorial ratings and judgments are made from this information by psychiatrists.

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[5]E. S. Schneidman, Deaths of Man. Baltimore, Maryland: Penguin Books, Inc., 1974.

[6]A. Temoch, et al., Journal of Nervous Mental Disorders, 138 (1964), p. 124.

[7]J. M. MacDonald, "Suicide and Homicide by Automobile," American Journal of Psychiatry, 121 (1964), pp. 366-370.

Pokorny, Smith and Finch[8] performed complete physical, psychological and automobile autopsies on 28 consecutive automobile fatalities in Houston, Texas, during the period of 1967-68 as compared to a matched comparison group. Pokorny reported that 25 of the fatalities were in an abnormal mental state versus only 3 in the control group. He also reported that among the fatalities 12 were found to be depressed and four were thought to be clearly suicidal. Eighteen were intoxicated and showed impaired judgment and poor impulse control. Pokorny points out that 15 percent of the fatalities were suicides -- a greater proportion than is usually reported.

In another study, Pokorny, Smith and Finch[9] suggest that poor vehicle maintenance may be the result of impulsive, irresponsible and antisocial personality traits exhibited in risky driving practices, thus increasing the chance for a traffic fatality. He reports that 76 percent of the 34 study vehicles involved in fatal crashes had one or more defects which were considered to be causative or contributory to the crash. Sixty-five percent of the drivers of the cars involved were found to have abnormal personality functioning. Norman Tabachnick[10] reported in his study comparing suicidal, accident and post-appendectomy subjects that the suicide group all experienced a sense of loss and depression as compared with the other two groups. Also, alcohol consumption significantly increased within two days prior to the suicide attempt. The accident group, however, was not significantly more self-destructive than the appendectomy group, suggesting that self-destructive or suicidal motives are not involved in accidents.

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[8] A. D. Pokorny, J. P. Smith, and J. R. Finch, "Vehicular Suicides," Life-Threatening Behavior, 2, No. 2 (1972), pp. 105-119.

[9] A. D. Pokorny, J. P. Smith, and J. R. Finch, "Do People Drive Problem Cars?" Traffic Safety, 72 (1972), pp. 16-17, 37-39.

[10] N. Tabachnick (ed.), "Accident or Suicide? Destruction by Automobile," A review by S. Perlin in Journal of American Academy of Psychoanalysis, 2, No. 4 (1974), pp. 389-391.

In another study by Tabachnick, et al.,[11] distinction is made between the suicidal fatality and the non-suicidal fatality. "People who died by suicide in automobile crashes," Tabachnick states, "had encountered loss of an important person, or a feeling of failure or being unloved just prior to their death. There were a number of depressive and self-punishing features in their general life style, and they tended to be relatively closely integrated with the significant others of their environment." These findings were contrasted to the fatal, but non-suicide, drivers who "encountered no clear, traumatic situation just prior to their deaths. They tended to be relatively active and exhibitionistic and were relatively distantly integrated with the significant others in their environment."

Melvin Selzer[12] studied samples of 30 alcoholics and 39 non-alcoholics with regard to number of accidents and suicidal preoccupations. He reported that suicidal individuals had significantly more accidents than the non-suicidal group. The combined alcoholic/suicidal group also had significantly more accidents ($p < .05$) than the alcoholic/non-suicidal group. This seems to indicate that preoccupation with and/or history of suicidal attempts influences the number of automobile accidents.

There appears to be some evidence that more accidents and accident fatalities than are often recognized are in actuality suicide attempts or suicides. However, there does not appear to be clear evidence that accidents are primarily the result of unconscious self-destructive or suicidal tendencies. Rather, MacDonald[13] states, "the choice of the auto as an agent of death seems frequently to be determined by the advantage of immediate availability."

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[11] N. Tabachnick, et al., "Comparative Psychiatric Study of Accidental and Suicidal Death," Archives of General Psychiatry, 14 (1966), pp. 60-68.

[12] M. L. Selzer, "Personality Versus Intoxication as Critical Factors in Accidents Caused by Alcoholic Drivers," Journal of Nervous Mental Disorders, 132 (1961), pp. 298-303.

[13] MacDonald, op. cit., p. 369.

Other researchers suggest that insurance benefits, and the lack of identification attract other suicide victims to use the automobile as the mode of suicide.

Suggestions, however, are made that might reduce highway fatalities. Pokorny[14] recommends a professional evaluation of those individuals who drive while intoxicated, researching therapy techniques to be used for the high-risk driver, that police be trained to recognize the psychologically vulnerable driver by accurate accident reports, and promoting psychiatric evaluations of automobile-related suicide attempts. In addition, MacDonald[15] suggests the early evaluation and treatment of persons who attempt to take their lives on the highway. This, he says, would be facilitated by recognition by the police and hospital personnel of deliberate intent in automobile wrecks. Schneidman[16] believes that a uniform system that eliminates inconsistencies and accurately determines cause of death (suicide, homocide, accident, undetermined) would prove valuable in identifying individuals in need of help and also would be a basis for further research.

In summary, there appears to be evidence that some automobile fatalities often considered accidental may, in fact, be suicide. Some research suggests that the self-destructive impulses are due to depression, guilt, and excessive conflicts of the individual which manifest themselves in an automobile suicide. The automobile may be used because it permits the individual to maintain denial that he/she is making a conscious suicide attempt. Automobile suicides may also be conscious, for insurance purposes. In any case, early recognition of the suicide-vulnerable individual would be a positive step in understanding and decreasing the automobile suicide.

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[14]Pokorny, op. cit., pp. 123-137.

[15]MacDonald, op. cit., pp. 366-370.

[16]Schneidman, op. cit.

VI. CRITICISM OF STUDIES

The validity of much of the reviewed research is questionable. In some cases, small samples were used to generalize to the entire population. Psychiatric or psychological interviews were often the method of evaluation, which leads one to doubt objectivity and, therefore, the results.

There is also a question regarding reliable measures of personality traits; thus the need for research is indicated to isolate, describe and operationally detect aspects of personality or emotional characteristics involved in accidents.

Barmack and Payne[1] have specifically criticized traffic-accident research for its inclination to treat all accidents as being homogeneous. They state that research must focus on the differences and causes of specific types of accidents.

An additional problem regarding accident-causation research in the personality factor arena is the difficulty in separating alcohol consumption as a variable. The stress, fears and financial difficulties resulting from the accident also play an important role in the accident victim's state of mind following an accident. Psychological measurements given to victims after an accident are confounded by normal stresses suffered by the occurrence of a traumatic event.

Wilde[2] suggests that "efforts should be made to put forward a more comprehensive conceptual framework, which will encompass the complexity of the variables involved and provide a guide for further work."

Henderson[3] believes that the pathological characteristics studied in the research on accident-proneness are not productive in that these traits change with time, age and circumstance, and do not aid in effective accident prevention.

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[1] J. Barmack and D. J. Payne, "Injury-Producing Private Motor Vehicle Accidents Among Airmen: Psychological Models of Accident-Generating Process," Journal of Psychology, 52 (1961), pp. 3-24.

[2] G. J. Wilde, "Social Psychological Factors and Use of Mass Publicity," The Canadian Psychologist, 14, No. 1 (1973), pp. 1-7.

[3] M. Henderson, "The Accident-Prone Car Driver - Does He Exist," Medical Journal of Australia, 2 (October 30, 1971), pp. 909-912.

Prevention

Preventive measures have been suggested by various authors with regard to reducing the number of work-related and automobile accidents. For example, it has long been believed that the individuals finishing drivers' education courses have lower accident and traffic violation rates than do individuals who do not complete these courses. Rainey, Conger and Walsmith[4] studied 6,906 male, 15½-year-old high school sophomores. The subjects were administered a battery of personality and attitude tests prior to legal driving experience. These subjects were followed to determine whether they elected to take drivers' education courses and were compared with non-drivers' education students. Rainey and his colleagues reported that the drivers' education group was less active, more deliberate and restrained, and less prone to rapid and hurried action ($p<.001$). This group was more serious, less concerned with dominating or persuading others, and less concerned with being conspicuous ($p < .005$). The drivers' education group was also found to be more shy, avoided social contact, was more inner-directed and reserved and less spontaneous ($p<.005$). These results seem to indicate that drivers' education courses have select students.

In the industrial arena, the foremen's or supervisors' attitude toward safety, the manner of organization and the quality of supervision are seen by Cohen, Smith, Kroes and Johnson[5] as the key determinants of safety level.

Willhite[6] argues that the "grass roots of industrial injury prevention lie in the line-supervisor's knowledge and understanding of the capacity, both physical and mental, of his men." He also suggests that in-field observations of the workers' environment and training programs designed specifically for the work environment be instituted.

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[4]V. Rainey, J. J. Conger, and C. R. Walsmith, "Personality Characteristics as a Selective Factor in Driver Education," Highway Research Board Bulletin, 285 (1961), pp. 23-28.

[5]A. Cohen, M. Smith, W. Kroes, and B. Johnson, "Mental, Emotional Factors Contribute to Job Safety," International Journal of Occupational Health, 44, No. 5 (1975), pp. 32-37.

[6]C. E. Willhite, "The Corrective Therapist in the Industrial Safety Setting," American Corrective Therapy Journal, 27, No. 1 (January-February, 1973), pp. 24-27.

Sampson[7] believes that it is better to concentrate on ergonomic principles, using training and educational campaigns to reduce the frequency of accidents. Sampson states that accidents are caused by an imperfect adjustment between man and his environment, and, in this respect, he feels that the concept of accident-proneness has hindered effective accident prevention and research.

Turfboer[8] suggests that educational techniques be used for drivers to help individuals recognize and pay attention to their feelings while driving. He also suggests obligatory or semi-obligatory education for alcoholic drivers.

Henderson[9] states that the most productive route for decreasing auto accidents lies in paying attention to the whole nature of the road-use system to minimize human frailty.

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[7]A. A. Sampson, "The Myth of Accident Proneness," Medical Journal of Australia, 2 (October 30, 1971), pp. 913-916.

[8]R. Turfboer, "Do People Really Drive as They Live?" Traffic Quarterly, 21 (1967), pp. 101-108.

[9]Henderson, op. cit.

VII. GENERAL SUMMARY

There seems to be tentative support for hypotheses which suggest a relationship between personality traits, emotions and feelings and the occurrence of accidents. Investigation of long-term accident proneness, characterized by a sustained psychological or physiological condition, is not definitive in relation to accidents. No clear-cut conclusions can be drawn from the research in this area due to limitations in research design. As it stands now, two similar studies often report conflicting results.

Short-term accident proneness, or accidents occurring as the result of life stress, however, seems to be generally supported by research. It appears that psychological stress, anxiety, conflict, guilt, depression or tension among other factors, very often precede accidents. Divorce or separation, a death in the family, and financial difficulties, among other stressful situations, appear to be linked to accident causation.

The Accident Process, proposed by Hirschfeld and Behan,[1] suggests an interesting way of looking at the phenomenon of accidents. Although little research has been performed in this arena, Hirschfeld and Behan offer insight into possible psychological characteristics of the accident victim, before and after the actual accident.

Although suicidal and self-destructive tendencies may account for a significant portion of automobile accidents and fatalities, only a handful of research and literature is available to confirm this hypothesis. Generally stated, the psyche does appear to be related to driving behavior and resulting misjudgments, accidents and fatalities. To what extent psychological factors are involved is questionable. More investigation and thorough research in the area is necessary. Definitive results from such exploration may help isolate personality characteristics, life stresses, etc., providing invaluable information necessary for appropriate and effective intervention important for preventing traffic and industrial accidents.

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[1] A. H. Hirschfeld and R. C. Behan, "The Accident Process: An Overview," Journal of Rehabilitation, 33, No. 1 (1967), pp. 27-31.

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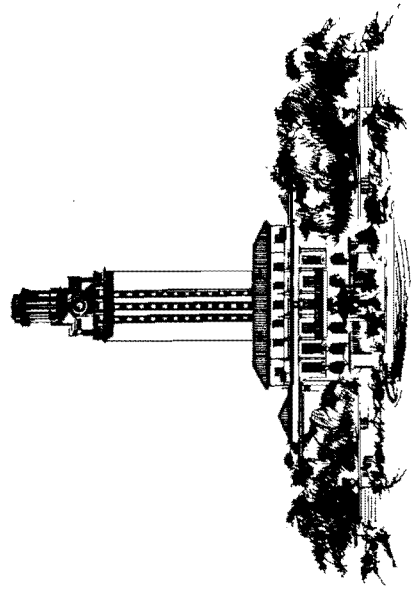

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