Intoxication at time of injury, substance use history, depression, and psychosocial adjustment were examined in 39 drivers and passengers who sustained spinal cord injury (SCI) as a result of traffic crashes. Passengers and drivers were equally likely to be intoxicated at the time of injury. However, intoxicated persons were more likely to have a history of marijuana use, and intoxicated drivers were more likely than intoxicated passengers, nonintoxicated drivers and passengers to use benzodiazepine (Valium) after injury. Intoxicated drivers drank more alcohol and used more benzodiazepine than did passengers after SCI. There was no relationship between driver/passenger status, intoxication, and post-injury depression or disability acceptance. These results suggest that substance use history may be related to intoxication at SCI onset. Furthermore, the ways in which drivers and passengers may make injury-related attributions that affect post-SCI rehabilitation outcome will be discussed.

Substance Abuse and Traffic-Related Spinal Cord Injury Inconsistencies in research results regarding intoxication of drivers and passengers at the time of their injuries limit our ability to understand the sequence and course of substance use by persons who sustain traffic injuries. Early studies indicate that, on average, drivers and passengers in injuries have equivalent blood alcohol levels (BAL; Heise, 1934; Birrell, 1971). However, a larger and more recent study (Söderström, Arias, Carson, & Cowley, 1984) found that in 77% of 62 crashes, drivers had significantly higher BALs than did passengers. Previous substance use history may predict injury-related intoxication (Heinemann, Schnoll, Brandt, & Maltz, 1988).

However, no studies to date have examined pre-injury substance use in order to predict driver/passenger substance use or rehabilitation outcome. The rehabilitation outcome of passengers and drivers who sustain injury may depend on pre-injury substance use and the degree of responsibility they assume for their role in the cause of the injury. The degree of responsibility one assumes for injury or illness may profoundly influence rehabilitation outcome (Janoff-Bulman, 1979). According to attribution theory, individuals who assume more responsibility for the cause of their injury typically have more positive treatment outcomes than do persons who blame others or attribute their injury to factors outside their control (Bulman & Wortman, 1977).

This study sought to examine injury-related intoxication and rehabilitation outcome in intoxicated and nonintoxicated drivers and passengers. We hypothesized that drivers and passengers with prescription medication and substance use histories would be more likely to be intoxicated at the time of their injury compared to persons without a history of substance use. Second, based on attribution theory, we hypothesized that passengers, regardless of
intoxication, would have more negative rehabilitation outcomes than would drivers. Methods Participants: The sample was drawn from the inpatient population at the Rehabilitation Institute of Chicago, a 176 bed, not-for-profit hospital that is a component of the Midwest Regional Spinal Cord Injury Care System. A total of 168 consecutively admitted patients met the eligibility criteria of age between 13 and 65 years, no post-traumatic amnesia exceeding 24 hours, traumatic injury occurring within the past 12 months, and English speaking. Physicians denied approval for 14 cases (10%) because of concerns about patients' physical or psychological well-being, leaving a pool of 154 patients. A total of 103 patients agreed to participate, 67% of the physician-approved group, or 61% of the eligible group.

Instruments: Participants reported the frequency and quantity with which they used benzodiazepine, codeine-containing compounds, narcotic analgesics, alcohol, marijuana and cocaine. Frequency was coded on an 8 point scale from 0 (no use) to 7 (binge use). The Acceptance of Disability Scale (AD, Linkowski, 1971) was used to assess values theorized to be associated with disability acceptance; it functions as a measure of self-esteem in persons with disabilities. Beck's (1967) Depression Inventory was used to quantify subjective experience of depression.

Procedure: Patients were initially approached about this study between 4 and 6 weeks after transfer to the rehabilitation hospital. Interviews typically lasted three hours. Three interviews were conducted: within six weeks of admission for rehabilitation, 6 months after injury, and 18 months after injury. At the first interview participants were asked to identify whether they were a passenger or a driver. Also, they were asked whether or not they were intoxicated at the time of their injury. The majority of this sample provided self-reports of intoxication that were consistent with serum ethanol analyses obtained at post-injury admission to emergency facilities (Heinemann, Schnoll, Brandt, & Maltz, 1988). Participants were paid $20 at the completion of each set of data collection.

Hypotheses: We expected that persons reporting intoxication at SCI onset would report greater pre-injury exposure to the six substances, and report greater post-injury use than would persons who did not report intoxication.

We expected that passengers, regardless of intoxication, would report greater depression and lower disability acceptance than would drive.

Results

Descriptive Statistics: Of the 103 participants, 39 reported injuries related to traffic injury; 56% of these 39 persons were drivers. Men comprised 74% of the traffic-injured group; the mean age was 29 years; 82% were white; 92% reported being employed at SCI onset; and 36% reported being intoxicated.

Passengers and drivers were equally likely to report intoxication at SCI onset. However, drivers reported a lower incidence of pre-injury exposure to benzodiazepine than did passengers (5% vs. 29%), as well as less exposure to narcotic analgesics (14% vs. 41%). Persons reporting intoxication at SCI onset
reported greater pre-injury exposure to marijuana than did persons not reporting intoxication (94% vs. 60%). Marijuana exposure was related to driver/passenger status and intoxication considered simultaneously, such that 100% of intoxicated passengers, 89% of intoxicated drivers, 77% of sober drivers, and 42% of sober passengers reported pre-injury exposure to marijuana.

The post-injury effect of driver/passenger status and self-reported intoxication on substance use was examined with contingency table analyses.

The greatest incidence of benzodiazepine use six months after injury was reported by intoxicated drivers (78%) followed by sober passengers (30%), sober drivers (10%), and intoxicated passengers (0%).

The effect of driver/passenger status and self-reported intoxication on alcohol use over the three assessment periods was examined with repeated measures ANOVA. A significant difference across the three time periods for intoxicated and nonintoxicated persons was observed such that intoxicated drivers and passengers reported a greater frequency and quantity of drinking before injury, while drivers, regardless of intoxication at SCI onset, drank more 18 months after injury. Passengers, regardless of intoxication at injury reported no drinking 18 months after injury.

The effect of driver/passenger status and self-reported intoxication on disability acceptance and depression over the three assessment periods was examined with repeated measures ANOVA. No effect due to driver/passenger status nor self-reported intoxication was found.

**Discussion**

Our hypothesis that drivers/passengers with prescription medication and substance use histories would be more likely to be intoxicated at the time of injury than persons without a history of substance use was confirmed in part.

Intoxicated passengers and drivers reported a greater incidence of alcohol and marijuana use before injury. This result is consistent with earlier studies which found that persons with substance use histories are more likely to be involved in traumatic injuries than are persons without a history of substance use problems (Skinner, Holt, Schuller, Roy & Israel, 1984).

Our second hypothesis, that passengers would have more negative rehabilitation outcomes than would drivers, was not supported. We expected that passengers would externalize their attributions and perhaps blame the driver for their injury. As a consequence of external attributions, we expected that passengers would experience a more negative rehabilitation outcome. This conceptualization is similar to that of investigators (Bulman & Wortman, 1979) who found that persons who blame others for their injury generally experience poorer rehabilitation outcome than do persons who assume responsibility for their injury. Our result of no relationship between driver/passenger status, depression, and disability acceptance and speculation about these results are consistent with the results of other investigators (Heinemann, Bulka, & Smetak, 1988) who found no relationship between attributions and disability acceptance. Passengers, regardless of their intoxication level, may have assumed responsibility for not warning the driver that he/she was intoxicated. Perhaps,
passengers were more likely to internalize responsibility for their injuries, and individuals who made external attributions were more likely to deny depression and achieve less favorable adjustments.

Intoxicated drivers reported a higher incidence of alcohol and benzodiazepine use after SCI, while passengers reported no drinking after injury. This result may be indicative of a more negative rehabilitation outcome for drivers. This finding is also more consistent with attribution theory. Drivers may externalize, rather than internalize responsibility for their injury and consequently drink more alcohol and use more prescription medication than passengers after injury. Although it would seem obvious that drivers are more in control of the circumstances surrounding the injury than passengers, it may be that intoxicated drivers felt circumstances were out of their control. In any case, the experience of persons sustaining traffic injuries must be evaluated closely in order to clarify this process which may be related to rehabilitation outcome.

These results suggest the importance of assessing substance use histories as a predictor of rehabilitation outcome. Longitudinal assessment of persons sustaining traffic injuries is required if we are to understand the sequence and course of substance use by persons who sustain traumatic traffic injuries.

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References


