Alcohol Consumption and Risk-Taking Behavior: an Analysis of 17-Year Data on Fatal Traffic Accidents

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In this paper, I analyze 17-year individual-level data on fatal traffic accidents (n = 488,829) and show that a large proportion of traffic accident fatalities attributed to alcohol consumption occur because inebriated victims (both drivers and occupants of the vehicle) are less likely to be restrained.

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EXTENDED ABSTRACT

Fatal traffic accidents have affected over 1.5 million people in the US during the past 17 years. Among those affected, 653,355 people have ultimately lost their lives. Police and media reports frequently mention alcohol as the leading cause of fatal traffic accidents. Indeed, academic research has found that car drivers who consumed alcohol before driving were more likely to be injured in car crashes (Connor, Norton, Ameratunga, and Jackson 2004). This result is hardly surprising as drivers who consume alcohol and then drive are more likely to exhibit impaired driving performance (e.g., Weiler et al. 2000). In this paper I demonstrate that, beyond its detrimental effect on driving performance, alcohol consumption is associated with increased risk-taking behavior as evidenced by lower restraint use rates among both drivers and occupants of vehicles.

Prior academic research supports the conjecture that alcohol consumption can increase risk-taking behavior. Lab studies have shown that experimental manipulations of alcohol consumption increase people’s propensity to seek risky monetary gains (Lane, Cherek, Pietras, and Tcheremissine 2004), as well as their willingness to enter high-risk situations during a driving simulation (Burian, Liguori, and Robinson 2002). Alcohol consumption can increase risk-taking behavior because it reduces people’s expectations about potential negative outcomes (Fromme, Katz, and D’Amico 1997). Further, alcohol consumption has been shown to have a detrimental effect on people’s attentional processing of threat-related cues (Curtin, Patrick, Lang, Cacioppo, and Birbaumer 2001). In turn, impairments in attention to the threat cue can inhibit fear response. Finally, alcohol consumption inflates positive self-perceptions and increases overconfidence (Schweitzer and Gomberg 2001; Schweitzer and Kerr 2000; Steele and Josephs 1990). Prior research has found that people tend to report positively biased self-evaluations on traits they deem important after consuming alcohol (Banaji and Steele 1989). In the context of transportation, another example of risk-taking behavior beyond dangerous operation of the motor vehicle by its driver is restraint omission by the driver and occupants of the vehicle.

Therefore, based on the aforementioned research, assuming that alcohol consumption reduces people’s expectations about potential negative outcomes (such as a potential traffic accident), I hypothesized that both the driver and occupants of a vehicle will be less likely to be restrained after consuming alcohol. I empirically tested my hypothesis in a large dataset of fatal traffic accidents that occurred in the US between January 1, 1999 and December 31, 2015. I derived individual-level data about victims of fatal traffic accidents from the Fatality Analysis Reporting System (FARS) of the National Highway Traffic and Safety Administration (NHTSA). The dataset comprised the following variables: age, race, and type (i.e., driver, occupant, pedestrian, or pedalcyclist) of the person, as well as whether the person was using a restraint (i.e., seat belt or helmet), whether the person was tested for alcohol (including the result of the test), and whether the person was killed.

First, I regressed whether the individual died in the traffic accident on the result of his or her alcohol test. Not surprisingly, a larger percentage of people that tested positive for alcohol died compared to the percentage of people that tested negative. Importantly, I regressed whether the individual was using a restraint on the result of his or her alcohol test and found a significant effect of alcohol consumption. While the majority of victims that tested negative for alcohol consumption. While the majority of victims that tested negative for alcohol were using a restraint, less than a third of the victims that tested positive were restrained. Note that all effects remain highly significant when controlling for the age, race, and type of the victim. Importantly, the relationship between alcohol and restraint use is significant for both drivers and occupants of the vehicle, as well as for people of all ages and races.

I further tested whether restraint use mediated the effect of alcohol consumption on the victim’s probability of dying. I found that the effect of alcohol on the victim’s probability of dying was significantly mediated by restraint use. Interestingly, my analysis shows that restraint use accounts for a large part of the effect of alcohol consumption on traffic fatalities. This result suggests that alcohol consumption is responsible for traffic fatalities not only due to its adverse effect on driving performance, but also because inebriated individuals are less likely to use a restraint. However, it is important to note that the current data do not permit any inferences about causality. Nevertheless, the experimental research discussed in the introduction suggests that alcohol consumption may account for at least part of the variance in restraint use.

In conclusion, according to the Center for Disease Control and Prevention (CDC), excessive alcohol consumption led to approximately 88,000 deaths and 2.5 million years of potential life lost each year in the US from 2006-2010, shortening the lives of dead victims by an average of 30 years (see also Stahre, Roeber, Kanny, Brewer, and Zhang 2014). Moreover, excessive alcohol consumption was responsible for 1 in 10 deaths among working-age adults aged 20-64 years, while the economic costs of excessive drinking in 2010 were estimated at $249 billion, or $2.05 a drink (Sacks, Gonzales, Bouchery, Tomedi, and Brewer 2015). Finally, alcohol consumption is the world’s third-largest risk factor for loss of years to disease and disability ranking higher than unsafe water and sanitation, high blood pressure, high cholesterol, and tobacco use (Sridhar 2012; World Health Organization 2011). Until today, public health campaigns have predominantly focused on preventing traffic fatalities by persuading drivers to refrain from getting behind the wheel after consuming alcohol. My data suggest that public health campaigns should inform not only drivers—but also occupants—of vehicles about the relationship between alcohol and risk-taking. Raising awareness about the relationship between alcohol consumption, restraint use, and traffic fatalities is necessary in order to minimize future casualties.

REFERENCES
Center for Disease Control and Prevention. Alcohol-Related Disease Impact. (Atlanta, GA: CDC).


