projectextramile
PREVENTING ALCOHOL-RELATED HARM

RESEARCH SUMMARY
Date Compiled: April 2025

Key takeaways from included research:

- Hazardous alcohol use is linked to accelerated brain aging and cognitive impairments, including behavioral inflexibility. In this study, higher alcohol use disorder identification test (AUDIT) scores predicted more brain aging, which in turn was associated with more perseverative errors in a behavioral task. These findings suggest that accelerated brain aging may help explain the connection between alcohol use and impaired behavioral flexibility, with implications for future research on mitigating these effects.
- A new study sought to determine effective health warnings about alcohol consumption and breast cancer risk. Health warnings increased attention, fear, perceived effectiveness, and severity of alcohol harms compared to a control group. Warnings about mortality and hair loss led to higher intentions to reduce alcohol consumption, highlighting the impact of these warnings on behavior.
- A Korean study aimed to evaluate how efforts to control underage drinking over the past decades have affected adolescent suicide. After peaking in 2009, suicide mortality began to gradually decline as more youth-targeted alcohol control policies were implemented. Policies included prohibition of proxy alcohol purchases for youth, the mandate for age-restriction signage in retail premises, and the increase in penalties for selling or serving alcohol to young people. Researchers concluded that limiting access to alcohol during adolescence is crucial from a suicide prevention perspective.
- This study aimed to explore factors behind the decline in passengers riding with alcohol-impaired drivers in fatal crashes since 1982. Researchers found the decline in passengers was primarily linked to a reduction in impaired drivers, rather than a decrease in passengers per impaired driver. Simulations suggest that a comprehensive strategy combining enforcement, education, alternative transportation, and stricter laws could significantly reduce passenger fatalities, while avoiding negative side effects.

GREATER ALCOHOL INTAKE PREDICTS ACCELERATED BRAIN AGING IN HUMANS, WHICH MEDIATES THE RELATIONSHIP BETWEEN ALCOHOL INTAKE AND BEHAVIORAL INFLEXIBILITY

February 2025

Background: Hazardous use of alcohol is associated with cognitive-behavioral impairments and accelerated aging. To date, however, accelerated brain aging has not been tested as a mediating factor between alcohol use and associated task-based behavioral deficits, such as behavioral inflexibility. Here, we evaluated hazardous alcohol use as a predictor of machine learning-derived brain aging and tested if this measure accounted for the relationship between hazardous alcohol use and a task-based measure of behavioral flexibility.

Methods: In this secondary analysis, we applied brainageR, a machine learning algorithm, to anatomical T1-weighted magnetic resonance imaging (MRI) images to estimate brain age for a sample of healthy adults (ages 22–40) who self-reported alcohol use with the alcohol use disorder identification test (AUDIT) and performed the hidden association between images task (HABIT), a behavioral flexibility task. Behavioral inflexibility was quantified as the proportion of perseverative errors performed on the HABIT as a measure of habitual action selection. We then analyzed AUDIT score as a predictor of brain aging, and brain aging as a predictor of behavioral inflexibility. Lastly, we conducted a mediation analysis to evaluate brain aging as a mediator between alcohol use and behavioral inflexibility.

Results: Controlling for chronological age and sex, a higher AUDIT score predicted significantly more accelerated brain aging, which was further associated with more perseverative errors on the HABIT. Moreover, brain aging significantly mediated the association between AUDIT scores and behavioral inflexibility.

Conclusions: Our findings demonstrate that alcohol use is a significant predictor of accelerated brain aging, even in young adulthood. In addition, our findings suggest that such brain changes may mechanistically link more hazardous alcohol use to impaired behavioral flexibility. Future studies should also explore factors, such as other lifestyle behaviors, that may mitigate alcohol- and age-related processes.

Source: Battista, J. T., Vidrascu, E., Robertson, M. M., Robinson, D. L., & Boettiger, C. A. Greater alcohol intake predicts accelerated brain aging in humans, which mediates the relationship between alcohol intake and behavioral inflexibility. *Alcohol: Clinical and Experimental Research*. https://doi.org/10.1111/acer.15534

DEVELOPING AND TESTING HEALTH WARNINGS ABOUT ALCOHOL AND RISK FOR BREAST CANCER: RESULTS FROM A NATIONAL EXPERIMENT WITH YOUNG ADULT WOMEN IN THE UNITED STATES

February 2025

Background: This study sought to identify effective health warnings about alcohol consumption and breast cancer risk among young adult female participants.

Methods: We tested a pool of health warnings in a national pilot study. We used the most effective designs from the pilot in the main experiment where young (ages 21–29) U.S. adult female participants (N = 1038) reporting past 30-day alcohol consumption were randomly assigned into 1 of 4 conditions where they viewed a health warning about (1) mortality, (2) mastectomy, (3) hair loss, or (4) control (non-health warning message). Participants were then randomly assigned to view 1 of 2 message types within each condition: text-only or pictorial. Warnings were shown apart from products. Outcomes were message reactions (attention to and cognitive elaboration of warnings, fear, hope, and perceived message effectiveness), attitudes and beliefs (perceived severity and susceptibility to

alcohol harms, and perceived response and self-efficacy to prevent alcohol harms), and behavioral intentions to stop or to reduce alcohol consumption in the next month.

Results: Multivariate analysis of covariance (MANCOVA) models testing between warning conditions showed estimated marginal means (EMM) for every health warning condition were significantly higher than the control for attention (control = 5.80 vs. mortality = 6.63, mastectomy = 6.81, hair loss = 6.83, all ps < 0.05), fear (control = 2.45 vs. mortality = 4.11, mastectomy = 4.16, hair loss = 4.02, ps < 0.05), perceived message effectiveness (control = 3.44 vs. mortality = 5.75, mastectomy = 5.82, hair loss = 6.09, ps < 0.05), and perceived severity of alcohol harms (control = 5.51 vs. mortality = 6.25, mastectomy = 6.09, hair loss = 6.35, ps < 0.05). There were no significant differences between the health warnings about cancer effects for perceived message effectiveness. EMMs for intentions to reduce alcohol consumption in the next month were significantly higher in the mortality (6.44) and hair loss (6.35) conditions versus control (5.61, ps < 0.05).

Conclusion: Exposure to health warnings about alcohol consumption and breast cancer risk (vs. control) resulted in greater attention, fear, perceived message effectiveness, perceived severity of alcohol harms, and intentions to reduce alcohol consumption.

Source: Massey, Z. B., Anbari, A. B., Wang, N., Adediran, A., Lawrie, L. L., Martinez, P., & McCarthy, D. Developing and testing health warnings about alcohol and risk for breast cancer: Results from a national experiment with young adult women in the United States. *Alcohol: Clinical and Experimental Research*. https://doi.org/10.1111/acer.70003

YOUTH-TARGETED ALCOHOL CONTROL POLICIES AND ADOLESCENT SUICIDE: AN INTERRUPTED TIME-SERIES ANALYSIS

March 2025

Background: Adolescent alcohol use is a social concern worldwide and is strongly associated with violence, criminal behavior, and especially suicide. The aim of this study was to evaluate how efforts to control underage drinking in Korea over the past decades have affected adolescent suicide, another public health issue in Korea.

Methods: An interrupted time-series analysis was conducted to assess the changes in adolescent suicide mortality following the implementation of youth-targeted alcohol control policies—the prohibition of proxy alcohol purchases for youth, the mandate for age-restriction signage in retail premises, and the increase in penalties for selling or serving alcohol to young people. Monthly suicide mortality among adolescents aged 10–19 years from January 2006 to December 2019 were acquired from the Korean Cause of Death Statistics.

Results: Suicide mortality peaked in 2009 at 654.1 per 10 million population and then gradually declined. Suicide mortality (per 10 million population) dropped by 0.26 after the implementation of the first polity, by 0.35 (–0.51 to –0.18) after the second policy, and by 0.11 (–0.52 to 0.31) after the third policy. Girls had a 0.50 (–0.90 to –0.09) reduction in suicide mortality following the first policy implementation, while there was no significant change in the rate for boys.

Conclusions: This study's findings support a link between the implementation of youth-targeted alcohol control policies and a reduction in youth suicide rates, suggesting that limiting access to alcohol during adolescence is crucial from a suicide prevention perspective.

Source: Choi, Y., Jin, T., Seo, J., Oh, J. K., & Kim, B. (2025). Youth-targeted Alcohol Control Policies and Adolescent Suicide: An Interrupted Time-series Analysis. *Drug and Alcohol Dependence*, 112557. https://doi.org/10.1016/j.drugalcdep.2025.112557

MODELING TRENDS AND PROJECTIONS OF RIDING WITH ALCOHOL-IMPAIRED DRIVERS IN FATAL CRASHES AMONG YOUNG ADULTS: A SYSTEM DYNAMICS APPROACH

February 2025

Objective: The purpose of the study was to investigate factors contributing to the decline in the number of passengers riding with alcohol-impaired drivers involved in fatal crashes since 1982, and to examine the impact of simulated interventions on this group through 2050.

Method: Historical data were obtained from the Fatality Analysis Reporting System. We applied linear regression to analyze changes in the average numbers of passengers per alcohol impaired young driver involved in fatal crashes between 1982 and 2020 by age and sex. We also extended our existing system dynamics simulation model developed to examine driving while impaired (DWI) behaviors of U.S. male and female drivers aged 15 to 24 and explored riding with an impaired driver (RWI) behaviors and corresponding interventions. We conducted sensitivity analyses to examine the likely trajectories of alcohol impaired drivers' passengers in fatal crashes across multiple scenarios through 2050.

Results: Our findings show that the decline in passengers of alcohol impaired drivers in fatal crashes primarily stems from a decrease in the number of impaired drivers, rather than a change in average number of passengers per impaired drivers. The simulation model replicated historical trends from 1982 to 2020, and the sensitivity analyses show that the policies reducing DWI trips also decrease RWI trips.

Conclusions: Wide adoption of a comprehensive strategy, combining increased enforcement, an alcohol truth campaign, the provision of alternative transportation, and the enactment of a new DWI restrictive law, could significantly reduce the number of passengers in fatal crashes involving alcohol-impaired drivers, while minimizing possible unintended consequences.

Source: Hosseinichimeh, N., MacDonald, R., Li, K., Fell, J. C., Haynie, D. L., Simons-Morton, B., ... & Vaca, F. E. (2025). Modeling Trends and Projections of Riding with Alcohol-Impaired Drivers in Fatal Crashes among Young Adults: A System Dynamics Approach. *Journal of Studies on Alcohol and Drugs*, jsad-24. https://doi.org/10.15288/jsad.24-00199