Adolescents to Adults: A Long-term Study of Impaired Driving

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Abstract

Background
Alcohol and drug impaired driving continues to be a major public health and traffic safety issue. Few studies have followed a population-based sample from adolescence into mid-adulthood to study patterns of impaired driving across the lifespan.

Aims
(1) To report the overall rates of impaired driving in mid-adulthood in this sample of men, and (2) To compare the variation in self-reported driving after drinking or drug use based on different items to assess this behavior.

Methods
The data are from the fourth wave of the Buffalo Longitudinal Study of Young Men, population-based sample of adolescent men originally recruited at ages 16-19. The initial study followed them into early adulthood (19-22 years of age) through waves 2 and 3. Wave 4 was instituted approximately 13 years later to examine impaired driving as the respondents aged into mid-adulthood (age 32-37 years). Wave-4 data consists of telephone interviews conducted by trained researchers and self-administered questionnaires that covered a broad range of topics. The follow-up rate for wave 4 exceeds 80% of the 602 living respondents. Several items were used to assess alcohol-impaired driving, alcohol and drug impaired driving, and drug impaired driving for the 12-months prior to the interview.

Results
For the item assessing driving within two hours of drinking, 49.4% reported this behavior. For the item assessing driving while feeling the effects of alcohol, 36.2% reported this. For the item assessing driving after having perhaps too much to drink, 25.4% reported this behavior. For driving while feeling the effects of a drug other than alcohol, 19.6% reported this, and 10.7% reported driving while feeling the effects of alcohol and another drug while driving.

Discussion and conclusions
Impaired driving continues at high rates into mid-adulthood. Driving while feeling the effects of alcohol at mid-adulthood substantially exceeded the 20% rate reported in late adolescence by the same sample. The items used to measure alcohol-impaired driving obtain significantly different estimates that decrease as the level of implied impairment increases. Drug-impaired driving occurs at a much lower, but still substantial rate. Future research will examine complex longitudinal models to identify specific factors associated with the continuation of impaired driving into mid-adulthood.
Introduction

Alcohol and/or drug impaired driving has a major impact on health and traffic safety throughout the world (World Health Organization, 2009). In the United States alone there are more than one-million arrests for impaired driving and over 10,000 alcohol-related traffic deaths each year (Department of Justice, 2012, Department of Transportation, 2012). The main focus of most research on alcohol and drug impaired driving has been on driving performance impairment, basic descriptive epidemiology (especially of offenders), prevention (primarily through general and specific deterrence), sanctions, and treatment. Longitudinal studies of impaired driving behaviors are highly limited (Moan et al., 2013). Few studies have examined a population-based sample from adolescence into mid-adulthood to study patterns of impaired driving across the lifespan. This study examines the prevalence of alcohol impaired driving across four waves of data collection in a population-based sample of men. The initial three waves of data were from the late adolescent-young adult time period (ages 16-22 years), with wave four being collected in adulthood (ages 32-37).

Aims

(1) To report the overall rates of impaired driving in mid-adulthood in this sample of men, and (2) To compare the variation in self-reported driving after drinking or drug use based on different items to assess this behavior. The first three waves of data have only a single measure of alcohol impaired driving, whereas the fourth wave has multiple measures of alcohol-impaired driving and multiple measures of drug impaired driving. These measures will also be assessed across racial groupings.

Methods

The Buffalo Longitudinal Study of Young Men is comprised of total of 625 males aged 16-19 in 1991-1992. The sample was only young men because the initial project focused on factors associated with longitudinal variation in criminal behaviors during the transition from adolescence to young adulthood. The participants were recruited from the general populations and include an over-representation of higher risk youth. This was accomplished by screening for higher risk indicators (e.g., transience, lack of supervision, etc.) and always recruiting those individuals with these risks and recruiting those who did not screen as high risk at a lower probability. The sample is well-balanced racially, providing nearly equal proportions of Whites and African-Americans (49% white, 45% African-American, and 6% from other racial/ethnic backgrounds). The full socioeconomic range is represented, with a slight over-representation of lower socioeconomic backgrounds. A total of three waves of data were collected approximately every 18 months in the initial study that covered ages 16-22 years old. A long-term follow-up study (Wave 4) was undertaken in 2008-2012 with a main focus on impaired driving behaviors. A total of 486 of the original sample were recruited and interviewed for Wave 4, resulting in an 81% follow-up rate among those subjects still living (486/602). Those 486 subjects are the focus of the current study. More details about the methods are available in Zhang et al. (2011).

The keys measures are those of impaired driving behaviors. All of the comparisons in this study are based on 12-month prevalence rates for drinking and/or drug impaired driving. The item from the initial three waves and included in Wave 4 is from Elliott et al. (1985) is: “In the last 12 months, how many times have you driven a motor vehicle while feeling the effects of alcohol?” To assess a broader range of survey items on potential alcohol-impairment, the following alcohol-specific items were included in Wave 4. In the last 12 months, how many
times have you (each is a separate item): Driven within two hours of drinking; Driven within four hours of drinking; Driven when perhaps had too much to drink.

To assess drug impaired driving, these measures were also assessed at Wave 4. In the last 12 months how many times have you (each is a separate item): Driven within one hour of using any drug other than alcohol; Driven within four hours of using any drug other than alcohol; Driven while feeling the effects of any drug other than alcohol; Driven while feeling the effects of alcohol and any other drug simultaneously. All of the alcohol and drug impairment items were turned into prevalence rates for these analyses. Note that the cross-tabulations for these analyses were statistically significant at the p < .05 level.

Results

The racial distribution of the Wave 4 sample was 49.4% White, 45.4% African American, and 5.3 other races, which is quite similar to the original sample. Figure 1 shows the longitudinal variation in alcohol impaired driving (feeling the effects while driving) from adolescence when alcohol consumption was illegal for those under age 21 (Wave 1 ages 16-19) to when some of the sample was of legal drinking age (Wave 2 ages 17-21, Wave 3 ages 19-22) to mid-adulthood in Wave 4 (ages 32-37). Drinking and driving was much higher at Wave 4 than for the previous waves. Most notable is the increase in drinking-driving by African Americans at Wave 4. The African American rate is now slightly higher than that of Whites, which decrease slightly from Wave 3 rates. The mixed race group has had a substantially lower rate across all time frames.

**Figure 1 Longitudinal prevalence rate of driving while feeling the effects of alcohol.**

The prevalence of various drinking-and-driving behaviors for Wave 4 is shown by race in Table 1. The simple measure of any driving within two hours of drinking has notably high prevalence rates for all races, especially for Whites. As the level of impairment attribution increases from “feeling the effects” to “perhaps had too much” the prevalence rates tended to decrease. The rates for Whites and African Americans were not different, while the other
racial category had a substantially lower rate. Over one-third of the entire sample and also for Whites and African Americans reported driving while feeling the effects of alcohol. At least one-quarter of Whites and African Americans reported driving after having too much alcohol in the past year.

**Table 1 Prevalence of drinking-and-driving behaviors by race Wave 4 (ages 32-37).**

<table>
<thead>
<tr>
<th>Race</th>
<th>(n)</th>
<th>Drove within 2hrs drinking</th>
<th>Drove feeling alc effects</th>
<th>Drove after too much alc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall (486)</td>
<td></td>
<td>49.4%</td>
<td>36.2%</td>
<td>25.4%</td>
</tr>
<tr>
<td>White (235)</td>
<td></td>
<td>60.4%</td>
<td>37.4%</td>
<td>28.5%</td>
</tr>
<tr>
<td>African-American (216)</td>
<td></td>
<td>42.3%</td>
<td>37.7%</td>
<td>25.1%</td>
</tr>
<tr>
<td>All Other (25)</td>
<td></td>
<td>36.0%</td>
<td>12.0%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

In general, the prevalence of drug-impaired driving was substantially lower than for alcohol impaired driving (see Table 2). African Americans had the highest rates of drugged driving compared to other races and the overall rate for each measure. Notably, over one-quarter of African Americans in the sample reported driving while feeling the effects of a drug. Unlike alcohol impaired driving, the shorter time frame (one hour) was associated with lower prevalence rates of drug impaired driving. The other racial category again had the lowest rates of drug impaired driving. The combined drug and alcohol driving impairment had the lowest rates, although about 1-in-10 reported doing this behaviour in the past year.

**Table 2 Prevalence of drugged-driving behaviors by race Wave 4 (ages 32-37).**

<table>
<thead>
<tr>
<th>Race</th>
<th>(n)</th>
<th>Drove within 1 hr drug use</th>
<th>Drove within 4 hrs of drug</th>
<th>Drove feeling drug effects</th>
<th>Drove w/both alc &amp; drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall (486)</td>
<td></td>
<td>16.9%</td>
<td>21.0%</td>
<td>19.6%</td>
<td>10.7%</td>
</tr>
<tr>
<td>White (235)</td>
<td></td>
<td>12.8%</td>
<td>16.6%</td>
<td>13.6%</td>
<td>8.5%</td>
</tr>
<tr>
<td>African-American (216)</td>
<td></td>
<td>23.1%</td>
<td>27.0%</td>
<td>27.4%</td>
<td>14.4%</td>
</tr>
<tr>
<td>All Other (25)</td>
<td></td>
<td>4.0%</td>
<td>16.0%</td>
<td>12.0%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Table 3 shows the prevalence of ever being arrested for an alcohol or drug impaired driving offense (DWI/DUI) by prevalence of drinking-and-driving at each wave. Clearly, starting early, such as being an underage drinking driver at Waves 1 and 2 and even at Wave 3, is associated with a higher risk of being a DWI/DUI offender. Slightly over 30% of the Wave 1 and 2 drinking drivers were later arrested for DWI/DUI. A much lower percentage of the Wave 4 drinking drivers reported ever having a DWI/DUI arrest. This suggests that there is substantial change in who are the drinking drivers across the waves of the study. A
comparison of Wave 3 and Wave 4 drinking drivers (no table) showed that only 47% of those who reported drinking and driving at Wave 3 were still doing so at Wave 4.

**Table 3 Arrest for impaired driving by prevalence of self-reported impaired driving.**

<table>
<thead>
<tr>
<th></th>
<th>Drove while feeling alc</th>
<th>Percent with DWI/DUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave 1</td>
<td></td>
<td>30.7%</td>
</tr>
<tr>
<td>Wave 2</td>
<td></td>
<td>30.8%</td>
</tr>
<tr>
<td>Wave 3</td>
<td></td>
<td>27.1%</td>
</tr>
<tr>
<td>Wave 4</td>
<td></td>
<td>19.0%</td>
</tr>
</tbody>
</table>

**Discussion and conclusion**

The results of this study indicate that drinking-and-driving behaviors change substantially over a life development time span. These changes were not uniform across racial groups. The overall prevalence rate for drinking and driving between Wave 3 (ages 19-22) and Wave 4 (ages 32-37) increased for the sample as whole; however, this was mostly accounted for by an increase in the African American prevalence rate. Whites and other races had modest changes.

The various measures of drinking-and-driving behaviors at Wave 4 showed differences in overall prevalence rates with the rate decreasing as the amount of implied impairment increased. This appears to be a logical and justifiable difference between the measures. Researchers need to be aware that the choice of the drinking driving measurement item could substantially impact on the actual behaviour being measured. The patterns of drinking-and driving-behaviors by race were similar for all of the measures, with the possible exception of the rate for Whites driving within two hours of drinking (suggesting that Whites may have more light drinking episodes).

The drugged driving measures at Wave 4 showed an interesting pattern to the results. The drugged driving rates were substantially lower than the drinking driving rates, but were still a notable amount of the sample (range of 11%-21% for the entire sample). African Americans tended to have higher rates than other racial groups across all measures of drugged driving. Future research needs to examine the factors that are associated with this variation across racial groups.

An examination of drinking driving prevalence longitudinally by arrest history for DWI/DUI showed that early starters (Waves1-3) had higher arrest rates than those reporting drinking and driving at Wave 4. This finding suggested that there must be substantial turnover from late adolescence to mid-adulthood (Wave 4) in who were the drinking drivers, which was substantiated by the finding that fewer than half of those who reported drinking-driving at Wave 3 also reported it at Wave 4. This result suggests that developmental models of drinking and driving are likely to be complex and have multiple longitudinal trajectories.

There are some limitations relevant to the current study. The sample is men only, so it may not adequately capture these behaviors for women. Also, although the sample is from the...
general population, the procedure oversampled those screened to be at higher risk for criminal behavior. Nonetheless, the findings from this study provide highly relevant avenues for future research on alcohol and drug impaired driving across the lifespan.

Acknowledgements

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References


