The Myth of Binge Drinking: Field Studies of Alcohol Use in North America

Adapting roadside survey techniques to other domains

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Field measurement of drinking

Nighttime Drivers
Field measurement of drinking

College Students
Field measurement of drinking

Recreational boaters
Field Measurement of Drinking

- Why bother?
- Limits of self-report data
- Link effect to time & location
- Triangulation
Self-reported vs Measured “Impaired driving” U.S.

Note. Episodes of “Alcohol-impaired driving” vs. % > 50 mg/dL
Roadside BAC Surveys

- Random sample of drivers (while driving)
- Interview sites ~ randomly sampled
- Nighttime only (~ 10 p.m. - 3 a.m.)
- Brief Interview
- Direct BAC measurement
- Very high response rates (~95%)
Population coverage varies

- National RSS - U.S.
- Statewide
  - Minnesota
  - North Carolina
- Local jurisdictions
  - Ohio - 2 counties
  - British Columbia - 2, 3 communities
Time of Week

- Friday & Saturday nights
  - National RSS
  - Ohio
- Wednesday – Saturday nights
  - Minnesota
  - North Carolina
  - British Columbia
Proportion of Drivers with non-zero BAC

<table>
<thead>
<tr>
<th>Location</th>
<th>Proportion</th>
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<tbody>
<tr>
<td>National 96</td>
<td>19.2%</td>
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<tr>
<td>NC 1994</td>
<td>13.7%</td>
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<tr>
<td>MN 1990</td>
<td>19.3%</td>
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<tr>
<td>BC 1995</td>
<td>18.4%</td>
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<tr>
<td>OH 90-92</td>
<td>18.7%</td>
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Proportion of Drivers with BAC > 50 mg/dL

- National 96: 8.4%
- NC 1994: 4.3%
- MN 1990: 9.8%
- BC 1995: 3.9%
- OH 90-92: 7.3%
Proportion of Drivers “Missed” at NC Enforcement Checkpoints by BAC

<table>
<thead>
<tr>
<th>Proportion</th>
<th>mg/dL</th>
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<tbody>
<tr>
<td>0.87</td>
<td>50-79</td>
</tr>
<tr>
<td>0.62</td>
<td>80-99</td>
</tr>
<tr>
<td>0.64</td>
<td>100-119</td>
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<tr>
<td>0.62</td>
<td>120+</td>
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</tbody>
</table>
Drivers with non-zero BAC, Vancouver/Saanich BC

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
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<tbody>
<tr>
<td>1996</td>
<td>18.7%</td>
</tr>
<tr>
<td>1998</td>
<td>13.8%</td>
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<tr>
<td>2003</td>
<td>12.3%</td>
</tr>
<tr>
<td>2006</td>
<td>11.7%</td>
</tr>
<tr>
<td>2008</td>
<td>7.8%</td>
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</tbody>
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Note. Interviews 9pm – 3am, Wednesday - Saturday
Measuring Drinking Among College Students
Concerns w/ self-report to measure impairment

- Memory (and counting?)
  - Specific numbers
  - 2 weeks or more

- "Standard" drink
  - Alcohol content varies widely per 'drink'

- Metabolism of alcohol varies
  - Drinking duration
  - Drink spacing
  - Food
  - Weight
  - Sex
UNC Student Breath Alcohol Survey

- Interviewed 4,298 randomly sampled UNC-Chapel Hill students
  - 6 weeks, early in fall term of 2 years
  - All nights of week
  - 10 p.m. - 3 a.m.
  - Returning to residence halls, off-campus apartments, fraternity/sorority houses
- Obtained breath alcohol measurement from 4,237 (98%)
Response Rate

- Interview + BAC: 83%
- Refusal: 15%
- Interview, no BAC: 2%
BAC Distribution

- Zero: 74%
- 6-49 mg/dL: 9%
- 50-99 mg/dL: 9%
- 100-149 mg/dL: 6%
- ≥150 mg/dL: 2%

Proportion of Respondents with BAC ≥ 80 mg/dL by Travel Mode

- Pedestrian: 17%
- Passenger: 10%
- Driver: 2%
- Overall: 13%
1993 Harvard College Alcohol Survey:

44% of American college students are Binge Drinkers
“It's not what we don't know that's the problem, … it's what we know that ain't so.”

– Mark Twain, Will Rogers, ?
What is Binge Drinking?

Journal of Studies on Alcohol:

**Binge:** An extended period of time – usually **two or more days** – during which a person repeatedly uses alcohol to the point of intoxication, and gives up his/her usual activities in order to drink.
“Binge” questionnaire measure

Quasi-index - Asked as single item

- Respondent does mental calculation
- Frequency (of action)
- Quantity (more than 5, 4 drinks)
- Time period (past 2 weeks; 30 days)
What is “Binge” Drinking?

Self-report measures:

**Binge drinker:**

- Five or more drinks on an occasion...
- Five or more drinks in a row...
- Five or more drinks at a time...
- Five or more drinks at a sitting...

at least once (or # times)

... in the past 2 weeks

... in the past 30 days
An evolving definition ...

“Binge drinking (consuming 5 alcoholic drinks on 1 occasion) generally results in acute impairment and has numerous adverse health consequences.”

Naimi et al., JAMA (2003)
What BAC would 'Binge' Drinker have?

Experienced alcohol researchers who measure BAC in field studies were nearly unanimous in suggesting

0.15% (150 mg/dL)
Mean BAC by number of drinks

Number of Drinks

0 20 40 60 80 100 120
Drinking Among Recreational Boaters in North Carolina
Purpose

1) Measure the prevalence of alcohol use among recreational boaters throughout NC

2) Estimate fatality risk
Data Collection

- Two summers (April thru Sept)
- Multi-stage stratified cluster sample
- Lakes, Rivers, and Sounds
Sample: Major Lakes and Sounds
Procedure

- Randomly selected stopped boats
- Interviewed operator, two passengers
- Sampled 1,561 boats, 2,816 boaters
Scientific Sampling

Multifaceted
Polychotomous
Random Number
Generator
Measuring Alcohol

Obtained breath measurements using hand-held Intoxilyzers
Measuring Alcohol

Intoxilyzer SD-400
Participation Rates

- Full Participation: 72%
- Refusal: 7%
- Breath Test Only: 11%
- Questionnaire Only: 9%
Respondent Age

Mean = 41
Self-Reported Alcohol Use (today)

- Yes: 18%
- No: 82%
Respondent BAC (Operator & psgrs)

- Zero: 86%
- 0.01 - 0.049%: 9%
- 0.05%+: 5%
Operator BAC

- Zero: 88%
- 0.01 - 0.079%: 10%
- 0.08% +: 2% illegal
BAC by Time of Day

- 0%
- 5%
- 10%
- 15%
- 20%

- .05% +
- .01%- .05%

- a.m.
- p.m.
Relative Fatality Risk While Boating by BAC: NC and MD

Log scale

mg/DL

Smith et al. (2001) JAMA, Vol 286, No. 23
Fatality Risk while Boating vs. Driving

- Boating crash
- Auto crash (MI)

Log scale vs. mg/DL
fin