Addressing the Driver's Role in Motor Vehicle Crashes: Past Failures, Future Successes

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This will be reflections on national & state policy/program efforts to address driver behaviors
- As opposed to experimental studies of driver behavior
- Current approach (past failures)
- Effective programs/policies
- Understanding human behavior
  - Knowing (& using) solid theory is essential
- Examples of success
  - Flowing from well-established theoretical principles
Study Credits Vehicles, but Not Drivers, for Better Road Safety

Cars are becoming safer, but the people who drive them are not …

Drunken driving rates have not changed much in 10 years, seat belt use has climbed at only a moderate pace, and people are driving faster.
MV Fatalities: A Decade of progress (?)

Fatalities

Fatality rate

Rate per 100 million VMT

1.73

1.44
MV Injuries: A Decade of progress

Injuries

143

Injury rate

94
Alcohol involvement in fatal crashes

![Graph showing alcohol involvement in fatal crashes from 1995 to 2005. The graph compares BAC > .00 and BAC > .08. The percentage of BAC > .00 remains relatively stable around 40% from 1995 to 2005, while BAC > .08 shows a slight decrease from 35% in 1995 to around 30% in 2005.]}
What $20,000,000 can do…

In 5 years:
More than 30,000 DWI checkpoints…
41,000 DWI arrests …
Alcohol Involvement in Fatal Crashes - NC

- 2001: 35.0%
- 2002: 37.6%
- 2003: 34.0%
- 2004: 34.9%
- 2005: 35.8%
The Past (& Present) – the problems

- Humans difficult to change
  - This isn’t “Rocket Science” … it’s harder!
- Failure to use available knowledge
  - Obsession with “messaging”
  - Misuse of groups (focus & other)
- Association ≠ cause
- Efficacy ≠ effectiveness
- Driving ability vs. driving behavior
The Past (& Present)

- Common sense, personal experience
  - Poor guidance
  - Often wrong, always inadequate

- “Cultural truisms”
  - Education (awareness)
  - Punishment
  - Attitudes cause behavior
Elements of Intervention Effectiveness

- Conceptual Soundness
- Implementation Fidelity
- Desired Outcome

- Difficult
- Astoundingly Difficult
- Distressingly Rare
A Typical Conceptual Model (Underage Drinking)

Knowledge about risks of drinking

Penalty for (illegal) drinking

→ Underage drinking (and driving)
Theoretical Bases for Initiative to Reduce Underage Drinking

Macro/Societal Level

- **Alcohol-related Public Policy**
  - mandated server training
  - dramshop liability
  - social host liability
  - license restrictions
  - excise tax
  - mandated compliance checks
  - alcohol sales restrictions
  - advertising restrictions

- **Social/Institutional Structures**
  - alcohol distribution system
  - social class
  - religious composition
  - business

- **Market Mechanisms**
  - income
  - response to demand
  - stimulation of demand

- **Legal Availability**
  - minimum drinking age
  - hours of sale
  - no service to intoxicated

- **Formal Social Controls**
  - size of threat
  - probability of detection
  - probability of threat application
  - speed of threat application

- **Economic Availability**
  - alcohol price
  - search and acquisition costs
  - disposable income

- **Physical Availability**
  - quantity accessible
  - geographic density of outlets
  - proximity to outlets

- **Social Availability**
  - prevalence of alcohol images
  - social class
  - religious composition
  - business

Micro/Individual Level

- **Intervening**
  - **Interpersonal Variables**
    - models of drinking
    - social roles
    - social interaction
  - **Individual Factors**
    - cognitions and perceptions
    - personality
    - biological
    - conditioned responses

- **Drinking Behavior**
  - minimum drinking age
  - hours of sale
  - no service to intoxicated

- **Health outcomes**
- **Psychosocial outcomes**

Source: Wagenaar, 1997
Solving social problems by changing people is apparently less productive than accepting people as they are and changing their circumstances instead.

$27 million is used to make nonsmokers out of smokers—that is, to try to change a basic habit—no significant effect is to be expected. Advertising molds or teases our appetites, but it doesn’t change basic tastes, values, or preferences. Try to advertise desegregation to racists, world government to chauvinists, temperance to alcoholics, or—as we still do at the cost of $15 million a year—drug abstinence to addicts, and see how far you get.

In fact, the mass media in general have proved to be ineffectual as tools for profoundly converting people. Studies have shown that persons are more likely to heed spouses, relatives, friends, and “opinion leaders” than broadcasted or printed words when it comes to deep concerns.

Another area in which efforts to remake people have proved glaringly inefficient is that of the rehabilitation of criminals. We rely heavily on re-educational programs for prisoners. But
Basic Social Psychology

\[ B = f(p,e) \]

Target environment where possible because:
- Individuals respond to environment
- Ensures fidelity of implementation
Basic Social Psychology

\[ B = f(p,e) \]

Implementation Fidelity \rightarrow Target Environment (Law, policy, etc.)
Not individuals

HUMAN BEINGS ARE NOT VERY EASY TO CHANGE AFTER ALL

Saturday Review - June 3, 1972
Effective program ...

- Implement with fidelity
  - Need second-order understanding ...
  - Phenomena involved in implementation
    - Communication complexity
      - Dyadic, group, mass
    - Organizational behavior
    - Political functioning
  - Well-supported theory invaluable!
GDL as example ... Environmental change

- Provides protection (environment)
  - Lower risk exposure
  - Reduced exposure
- Feasible way to achieve needed practice
  - Experienced drivers as mentors
  - Free of charge
- Works with little active enforcement
  - Supports parents
- Provides motivation
  - Reward rather than punishment
Crash Rate Ratios for 16 & 17 vs. 25-54 year-olds, NC 1991-2003
16 year-old Nighttime crashes (9 pm – 5 am)
Time to first crash: GDL drivers better
Beyond environmental modification

Conceptual Soundness → Science, not folklore

- Understand phenomenon
- Well-supported theory
Some useful theories

- General Deterrence Theory
- Theory of Planned Behavior
- Social Learning Theory (Social Cognitive Theory)
- Fuzzy-Trace Theory
Influencing Individual Behavior

Using the Theory of Planned Behavior

- For behaviors where
- Person has needed skill
- Environmental constraints minimal
- Environmental facilitation minimal
- Person feels able and responsible
- Then ...
Influencing Individual Behavior

\[ B \approx BI = w_1 \sum_{i=1}^{n} B_i E_i + w_2 \sum_{j=1}^{m} NB_j MC_j \]

- \( B_i \) = beliefs about possible consequences (i) of behavior
- \( E_i \) = evaluation of consequences of behavior
- \( NB_j \) = normative beliefs about behavior by person j
- \( MC_j \) = motivation to comply with expectations of person j

\( w_1, w_2 \) = weighting factors for beliefs about act, normative expectations
High visibility enforcement ... works

\[ B \approx BI = w_1 \sum_{i=1}^{n} B_i E_i + w_2 \sum_{j=1}^{m} NB_j MC_j \]

- Publicity about enforcement should ↑ \( B_i \)

where \( i \) = perceived likelihood of detection
Promising “educational” approach ...

\[ B \approx BI = w_1 \sum_{i=1}^{n} B_i E_i + w_2 \sum_{j=1}^{m} NB_j MC_j \]

Social Norms

- Beliefs about how members of a group generally behave (and should behave)
- *Perceived* norms influence behavior
  - . . . even though we may not be consciously aware of them
A broad communication strategy ...

- Acquaint population with normative information
- Emphasize positive rather than negative
  - Comprehensive, multi-channel, multi-faceted
  - Use sophisticated marketing/advertising tactics
- To correct misperceptions ... or
- Publicize poorly known fact (about behavior)
64% of U of A students have 4 or fewer drinks when they party.

*Based on survey data collected by Campus Health Service (1997) from 270 U of A students in a randomly selected mailing. Funded by the US Dept. of Health & Human Services.
Norm interventions present happy, normal people that target can identify with, associated with factual information documenting desirable normative behavior.

Most UofA students drink moderately

Women typically have
2 drinks
over
3 hours

1 drink = 12 oz. beer = 4-5 oz. wine = 1 oz. liquor
It takes about 1 hour per drink to clear alcohol from the body.

Based on survey data collected by Campus Health Service (2000) from 856 students in randomly selected classes.
No preaching, no threats, no scare tactics. Message is respectful of target audience rather than condescending or implicitly judgmental.

**Students**
drink less than you think

**Students**
drink less than you think

UA students average 3 drinks a week*

1 drink =
12 oz. beer = 4-5 oz. wine = 1 oz. liquor

Based on survey data collected by Campus Health Service (2001) from 1220 students in randomly selected classes.

1 drink =
12 oz. beer = 4-5 oz. wine = 1 oz. liquor

Based on survey data collected by Campus Health Service (2001) from 1220 students in randomly selected classes.
We’re not Marlboro men.
7 out of 10 Montana teens are tobacco free.

www.MOSTofus.org

A message from The Montana Department of Public Health & Human Services.
MOST Montana young adults (4 out of 5) don’t drink and drive

DESIGNATED DRIVERS SAVE LIVES
Most Montanans
(3 out of 4)
Wear Seatbelts
UNC Social Norm Program
Using a Direct Measure of Alcohol Consumption
Goals:

- Examine actual student drinking
- Develop and evaluate Social Norm program to reduce:
  - Drinking
  - Driving after drinking
Social Norms & Student Drinking

Students overestimate drinking on college campuses

- Frequent & excessive drinking assumed normative

- Implicit pressure on students to drink

- Correcting misperceptions should help reduce student drinking (& driving)
UNC-CH BAC Survey

- Determine actual extent of drinking by UNC students
- Verbal Behavior ≠ Behavior
- Directly measured drinking
Fall 1997: Interviewed 1,846 randomly sampled UNC students

- All nights of week, 10 p.m. – 3 a.m.
- Dorms, greek houses, off-campus apts
- 86% participation
- Breath alcohol measurements
  N = 1,790 (97%)
Overall BAC Distribution

- Zero: 72%
- 0.006 - 0.049%: 9%
- 0.05 - 0.099%: 8%
- 0.10 - 0.149%: 8%
- 0.15%+: 2%

N = 1,790
BAC Distribution by Night of Interview

Party nights (Thu-Sat)
- 64% zero
- 13% .002-.049%
- 11% .050-.099%
- 12% >=.10%

Other nights (Mon-Wed)
- 85% zero
- 10% .002-.049%
- 10% .050-.099%
- 5% >=.10%

N = 1,789
Alcohol Fact:

Whether it’s Thursday, Friday or Saturday night, 2 out of 3 UNC students return home with a .00 Blood Alcohol Concentration.
“2 out of 3” Campaign

- CTOPS (Freshman orientation)
- News conference (National attention)
- Posters
- “Know the Fact” incentives
- Newspaper ads
- Web site
- Opportunitistic actions
It's not what they say, it's what they blow.

Whether it's Thursday, Friday or Saturday night, 2 out of 3 UNC students return home with a .00 blood alcohol concentration.

Most of those who drink have 4 or less.
Basic Message

It's not what they say, it's what they blow.

Whether it's Thursday, Friday or Saturday night, 2 out of 3 UNC students return home with a .00 blood alcohol concentration.

Most of those who drink have 4 or less.
Reminder that this is not simply self-report data

“It’s not what they say, it’s what they blow.”
Full Message:

Including “Most of those who drink have four or less.”
Source of Fact to Lend Scientific Credibility

“Based on Fall 1997 breathalyzer data collected between 10 p.m. and 3 a.m...at fraternities, sororities, residence halls, apartments.”
Whether it’s Thursday, Friday or Saturday night ... 2 out of 3 UNC students return home with a .00 B.A.C.

Most of those who drink have 4 or less.

*It’s not what they say, it’s what they blow.*

Results based on breathalyzer data collected between 10:00 pm and 3:00 am during Fall 1999 and Fall 1997 as students returned home to fraternities, sororities, residence halls and apartments.

www.2outof3unc.org
Whether it's Thursday, Friday or Saturday night...
2 out of 3 UNC students return home with a .00 blood alcohol content

It's not what they say, it's what they blow.

http://chenkarak.org
Whether it’s Thursday, Friday or Saturday night, 2 out of 3 UNC students return home with a .00 blood alcohol concentration.

Most of those who drink have 4 or less.

Fall 1997 breathalyzer data collected between 10:00 pm and 3:00 am as students returned home to fraternities, sororities, residence halls and apartments.

It’s not what they say, it’s what they blow.
Whether it’s Thursday, Friday or Saturday night

2 out of 3 UNC students return home with a Zero BAC

It’s not what they say, it’s what they blow.

Based on Fall 1999 breathalyzer data collected from 2,546 students as they returned home to residence halls, fraternities, sororities and apartments between 10 p.m. and 3 a.m.

http://www.2outof3unc.org
Sponsored by Student Affairs
It's not what they say. It's what they blow.

Most students say they drink and they do. That's a fact.
But whether it's Thursday, Friday, or Saturday night, 2 out of 3 UNC students return home with a .00 blood alcohol concentration. That's a fact, too.
And most of those who drink have 4 or less.

Based on Fall 1999 and 1999 breathalyzer data collected between 11:00 p.m. and 7:00 a.m., as students returned home to residence halls, apartments, fraternities, and sororities.
Sponsored by Student Affairs. Read more at http://www.2outof3.org
1999 & 2002 Survey Findings

- 1999: N = 2,540 students
- 2002: N = 1,886 students
Participation Type by Year

- Breath only
- Survey only
- Breath & survey

BAC Distribution, Night of Interview

- **1997**
  - Zero: 71%
  - 0.002-.049%: 10%
  - 0.050-.099%: 9%
  - >=.10%: 10%

- **1999**
  - Zero: 74%
  - 0.002-.049%: 11%
  - 0.050-.099%: 9%
  - >=.10%: 6%

- **2002**
  - Zero: 76%
  - 0.002-.049%: 10%
  - 0.050-.099%: 7%
  - >=.10%: 7%

**Comparisons**
- 1997 vs. 1999: p < .001
- 1999 vs. 2002: n.s.
BAC Distribution, Night of Interview

- **1997**
  - 0.02-.049%
  - 0.050-.099%
  - >=.10%
  - 10% (Green)
  - 9% (Yellow)
  - 10% (Red)

- **1999**
  - 0.02-.049%
  - 0.050-.099%
  - >=.10%
  - 11% (Green)
  - 9% (Yellow)
  - 6% (Red)

- **2002**
  - 0.02-.049%
  - 0.050-.099%
  - >=.10%
  - 10% (Green)
  - 7% (Yellow)
  - 7% (Red)

**Statistical Analysis**

- 1997 vs. 1999: p < .001
- 1999 vs. 2002: n.s.
Heavy Drinking, Night of Interview

- 1997: 16% (males), 4+ (females)
- 1999: 13% (males), 4+ (females)
- 2002: 11% (males), 4+ (females)

28% decrease from 1997 to 2002

97 vs 02
p < .05
Heavy Drinking, Night of Interview
(Drinkers only)

- 5+ (males)
- 4+ (females)

<table>
<thead>
<tr>
<th>Year</th>
<th>1997</th>
<th>1999</th>
<th>2002</th>
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<tbody>
<tr>
<td>55%</td>
<td>49%</td>
<td>45%</td>
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97 vs 02
p < .05
Measured drinking among drivers:

- 1997 - 15.3% non-zero BAC
- 2002 - 10.8% non-zero BAC
Driver BACs by Year
(Drinkers only)

1997: 27% (0.05 - 0.09%), 13% (> 0.10%)
1999: 15% (0.05 - 0.09%), 7% (> 0.10%)
2002: 14% (0.05 - 0.09%), 3% (> 0.10%)
Self-reported Frequent Heavy Drinking National vs. UNC

- Harvard CAS
- UNC

1997 1999 2001-02
Conclusions

Comprehensive Norms program affected:

- Measured BAC
- Nightly drinking
- Nightly heavy drinking
- Frequent heavy drinking
- Driving after drinking
Social Norm approaches highly promising

- But, to succeed they require ...
  - Strict adherence to SN principles
  - Intense, long-term effort
  - Commitment of time, $, creativity
Social Norm Programs - step-by-step

- Crucial steps
  - Collect & analyze data
  - Design comprehensive program
  - Develop & test messages
  - Revise messages
  - Continue data collection & evaluation
  - Develop, test, revise new messages
  - Program must continue
National Social Norms Resource Center

http://socialnorm.org
Montana Social Norms Toolkit

http://MostofUs.org
Hobart & William Smith

http://alcohol.hws.edu/
Social Norm Resources:

www.socialnorms.campushealth.net
MostofUs.org
alcohol.hws.edu/
socialnorm.org
Ineffective Messaging