Distracted Driving: Truth & Consequences

NCOIL 2013
June 11, 2013

The Threat

Driving while distracted increases crash risk

- 4.3 times (Redelmeier & Tibshirani, 1997)
- 4.1 times (McEvoy, et al., 2005)
- 2 to 6 times (Atchley & Dressel, 2004)
- More than drunk driving (Strayer et al., 2006)
- Texting is worse, even with automatic systems (AAA FTS, 2013)
Phone records after a crash

- Phone records of 456 drivers involved in injury crashes over 27 months.
- Talking on a phone increased risk 4.1 times
- Hand-held and hands free produced same risk

Phone records after a crash

- Phone records of 699 drivers involved in non-injury crashes over 14 months.
- Talking on a phone increased risk 4.3 times
- Hand-held and hands free produced same risk

Case Crossover Designs

- These designs compared drivers to themselves to assign odds ratios
  - What is the chance a driver has an accident when they are on the phone or not?
- All other distractions are equal in both cases
- Increase in risk accounts for other distractions
**Attentional screening**


Used an attention assessment tool utilized to screen older drivers.
- Conversation reduced attention, leading to an increase in accident risk of 2 to 6 fold
- 20 year-olds performed like older adults with the onset of dementia

**Driving simulation**


Drivers with cell phones:
- Drove more slowly
- 9% slower to hit the brakes
- 24% percent more variation in following distance
- More likely to crash

**On-road + sim + neuroscience**


Drivers drove an instrumented vehicle, in a simulator and both behavior and their brain activity was measured:
- Cell phones more than doubled distraction
- Text to speech technology tripled distraction
- Passive sources (radio) were not distracting
Where are the crashes?

The National Safety Council reviewed 180 fatal crashes from 2009 to 2011, where evidence indicated the drivers were using cell phones.

What about “naturalistic” data?

- Very few crashes
  - 2 in this study
- Data analyzed only if “triggers” occur
  - Triggers flawed
- Drivers know they are being recorded
- Miscoding
  - Fail to see phone
The Bottom-Line
DISTRACTED DRIVING POSES THE SAME RISK AS DRUNK DRIVING
- Crash studies with phone records
- Simulator studies
- Behavioral and neuroscience studies
- Meta-analyses of scores of studies

ONE-QUARTER OF ALL CRASHES ARE DUE TO CELL PHONE DISTRACTIONS
- National Safety Council (2008)

The digital natives are here

Digital natives
Cell technology use is
- More frequent
- Earlier
- Reinforced by
  - peer networks
  - the brain
Heavier use (teens)

- Text a peer every day (63%)
- Calling (39%)
- Face-to-face (35%)
- Social network messaging (29%)
- Instant messaging (22%)
- Email (6%)

Earlier and deeper adoption

- First cell phone: 8 years old.
- Exclusion from texting lowers self-esteem
- Inclusion increases peer connectedness

The brain is wired for smart phones

Tamir & Mitchell, 2012
“While these aren’t the craziest fines in the world, the fact that the government is so strictly regulating what we do in our cars frustrates me. I’m not going to pretend like this is the worst thing to happen to me, but I’m bothered that now not only do I need to interrupt my phone call when I see an officer, I also need to make sure it doesn’t look like I’m punching the buttons.”

RESTRICTION ON TEXTING WHILE DRIVING TARGETS THE WRONG DISTRACTIONS

Scott Pearring, January 9, 2009

It will get worse

A hands-free picture taken using Google Glass by Google X employee Steve Lee while he was diving.

Helmet: It’s the law

Texting: Because he can
Why do we do it?

Safety requires understanding people

The brain deceives us

We think we understand risk
Crashes Claim Teen Lives

USA - In another day of tragedy, eight young Americans between the ages of 16 and 19 were killed in motor vehicles. Another 960 were taken to emergency rooms with injuries ranging from life-threatening to less severe. The Center for Disease Control reported that though this demographic only accounts for 14% of the U.S. population, they account for about 30% of the cost of crashes.
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The brain deceives us

We think we see more than we do

Simons & Levine, 1998
Our view:
A complex computer

Reality:
A limited processor
Attention demo
(not included in handout)

Multitasking is a myth
The brain deceives us

Attitudes are disconnected from actions

“Everybody is doing it”

Reports about 15 texts while driving per week

Atchley, Atwood & Boulton, 2011
Knowing risk does not change behavior

- Drivers rate distracted driving as very risky
- They do it anyway
- Importance of the call/text outweighs risk

Attitudes versus actions

Drunk driving versus texting and driving

Drunk driving narrative

“By this time David had had quite a lot of alcohol to drink, and he drank the remaining contents of his drink and said good-bye to the other party guests. He drove for a few blocks. He came to a stoplight controlling traffic at a broad intersection.”
Texting and driving narrative

“As he was driving he picked up his cell phone and started to compose a text message to girlfriend telling her he was on his way home from the party. Still text messaging, he came to a stoplight controlling traffic at a broad intersection.”

How preventable was the crash?

What fine should be assigned?
What jail time should be assigned?

<table>
<thead>
<tr>
<th>Time</th>
<th>Exp. 1 (No law)</th>
<th>Exp. 2 (Distraction law)</th>
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<tr>
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<td></td>
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<tr>
<td>None</td>
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</tbody>
</table>

Solving the problem

Myth #1: Drivers are not ready for this
Public opinion
Quinnipiac University
- 2424 US Voters
- November 2010, +/- .02
- By a 63% – 34% margin, American voters support a federal ban on cell phone use while driving, even while using a "hands-free" device

Nationwide Insurance “On Your Side Survey”
- 1008 US drivers
- August 2009, +/- .03
- 80% support ban on texting or emailing
- 57% support a ban on all cell phone use while driving

Corporate bans
- Exxon/Mobil
- DuPont
- Halliburton
- Shell
- BP
- Chevron
- Abbott
- Cargill
- CSX Intermodal
- Schneider National
- UPS
- Sysco Corporation
- Time Warner Cable
- Owens Corning
- AstraZeneca
- Spectra Energy

Fortune 500 companies w/ total bans: 20%

Victim impact
FOCUS DRIVEN
ADVOCATES FOR CELL-FREE DRIVING

...
Solving the problem

Myth #2: Laws have no effect

Laws can be effective

- Fatalities decline in states with texting bans
- Primary bans 7x more effective
  - Secondary bans are ineffective
- Enforcement matters

Myth #3: We can’t enforce the laws
NHTSA enforcement study

- Syracuse: 32% decrease in handheld phone use and texting.
- Hartford: 57% drop in handheld phone use and a 72% decrease in texting.

Solving the problem

Myth #4: Technology will save us

Even the best technology requires attention

Cognitive Distraction Rating Scale

AAAFTS, 2013
Potential technological solutions

- In-car driver jamming
- Non-optional interlocks for phones paired with cars
- Parental enforcement of voluntary systems
- Employer phone tracking

Solving the problem

Myth #5: Productivity will decline

Productivity may go up!

- Fortune 500’s with bans
  - 7% said productivity decreased
  - 19% said productivity increased
  - 22% said productivity the same
  - 52% don’t yet know
- NSC members with bans
  - 1.5% reported productivity decreased
  - 10% report productivity increased
Potential technological solutions

- In-car driver jamming
- Non-optional interlocks for phones paired with cars
- Parental enforcement of voluntary systems
- Employer phone tracking

Summary

- People are dying and distraction is a major cause
- Our brain disguises how risky distracted driving is
- Technology is a part of the solution but “hands-free” isn’t one of them
- There are a lot of myths, but enforced laws will make a difference

Thank you for your attention!

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