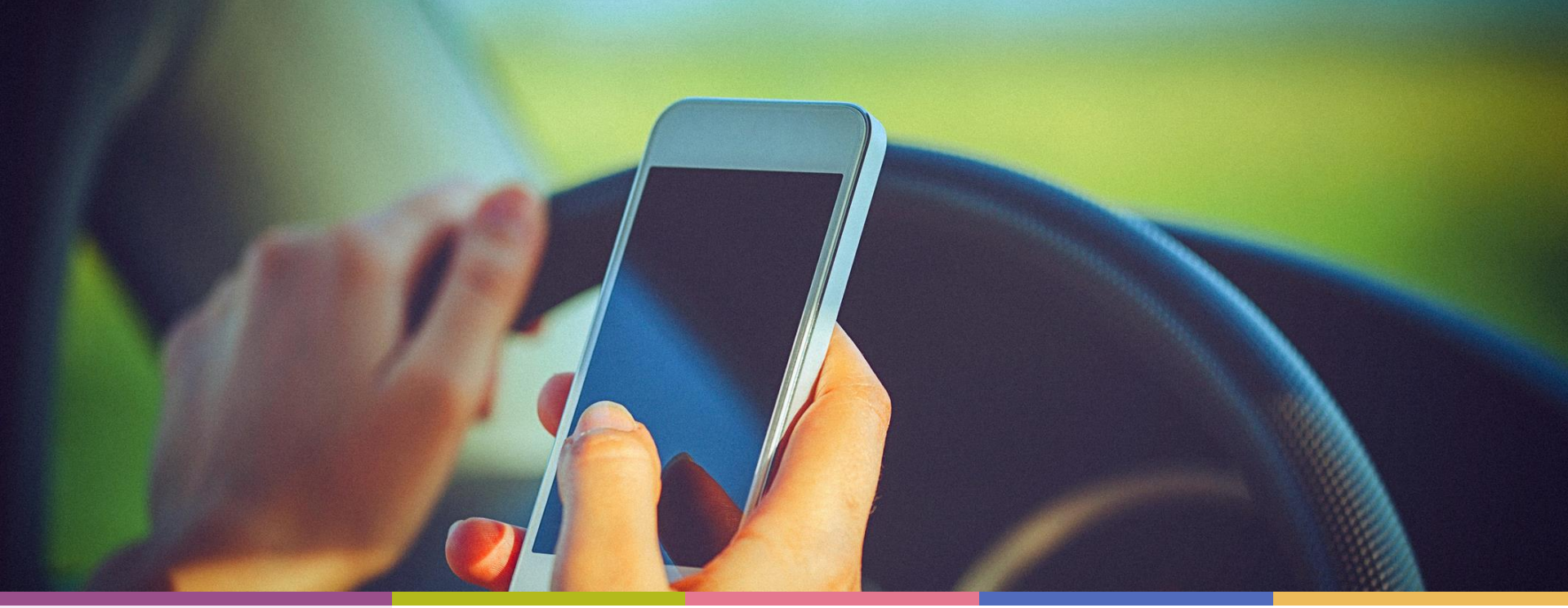


Children's Safety Network
at Education Development Center

EDC Learning transforms lives.

Distracted Driving among Teens

What We Know about It and How to Prevent It

May 31st, 2017

Tech Tips

Audio is broadcast through computer speakers

If you experience audio issues, dial (866) 835-7973 and **mute computer speakers**

Use the Q & A to ask questions at any time

Download resources from File Share pod

You are muted

This session is being recorded

Presenters

Ian J. Reagan, Ph.D.

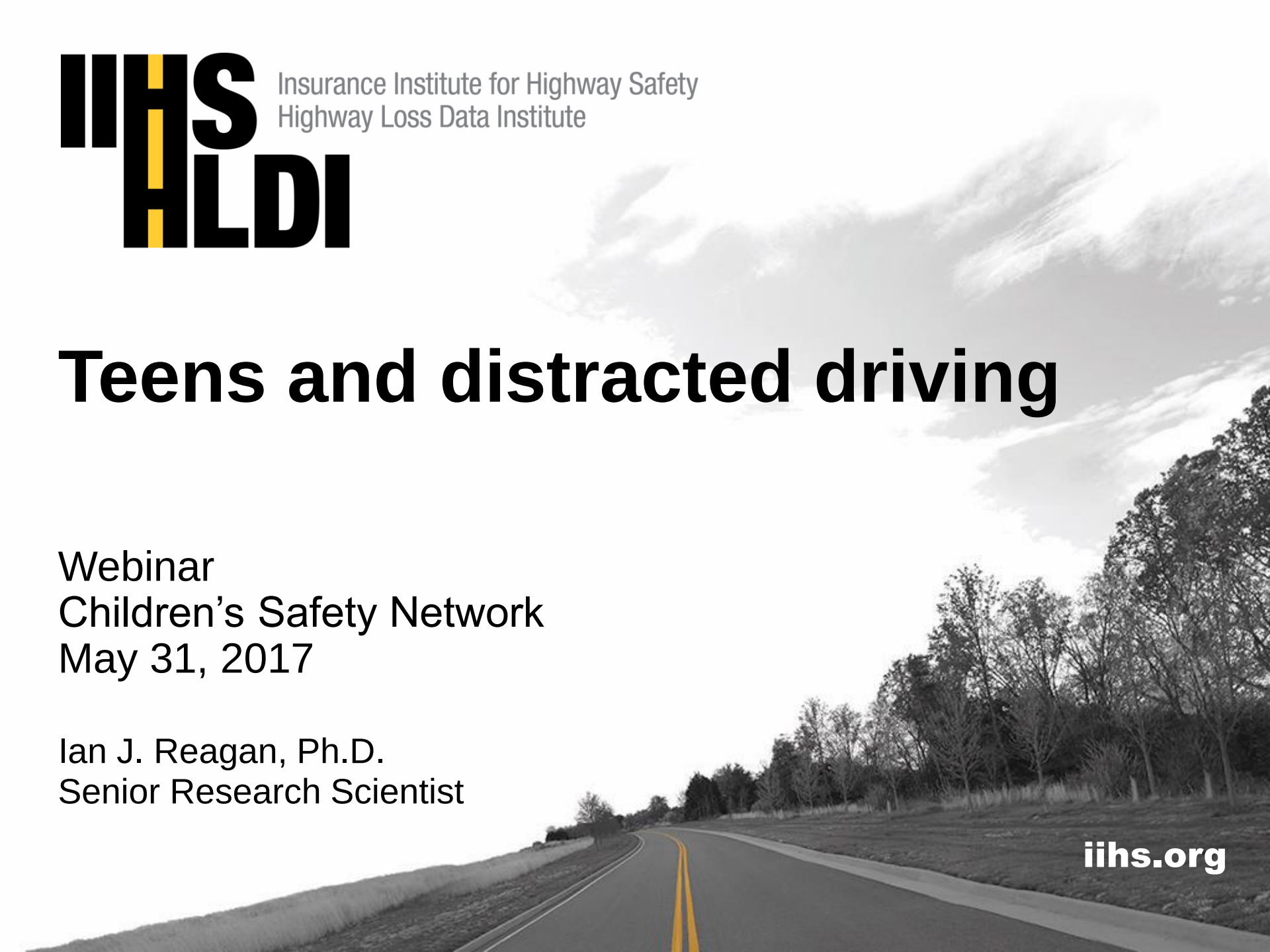
Dennis Thomas, Ph.D.

Insurance Institute for Highway Safety
Highway Loss Data Institute

Teens and distracted driving

Webinar
Children's Safety Network
May 31, 2017

Ian J. Reagan, Ph.D.
Senior Research Scientist



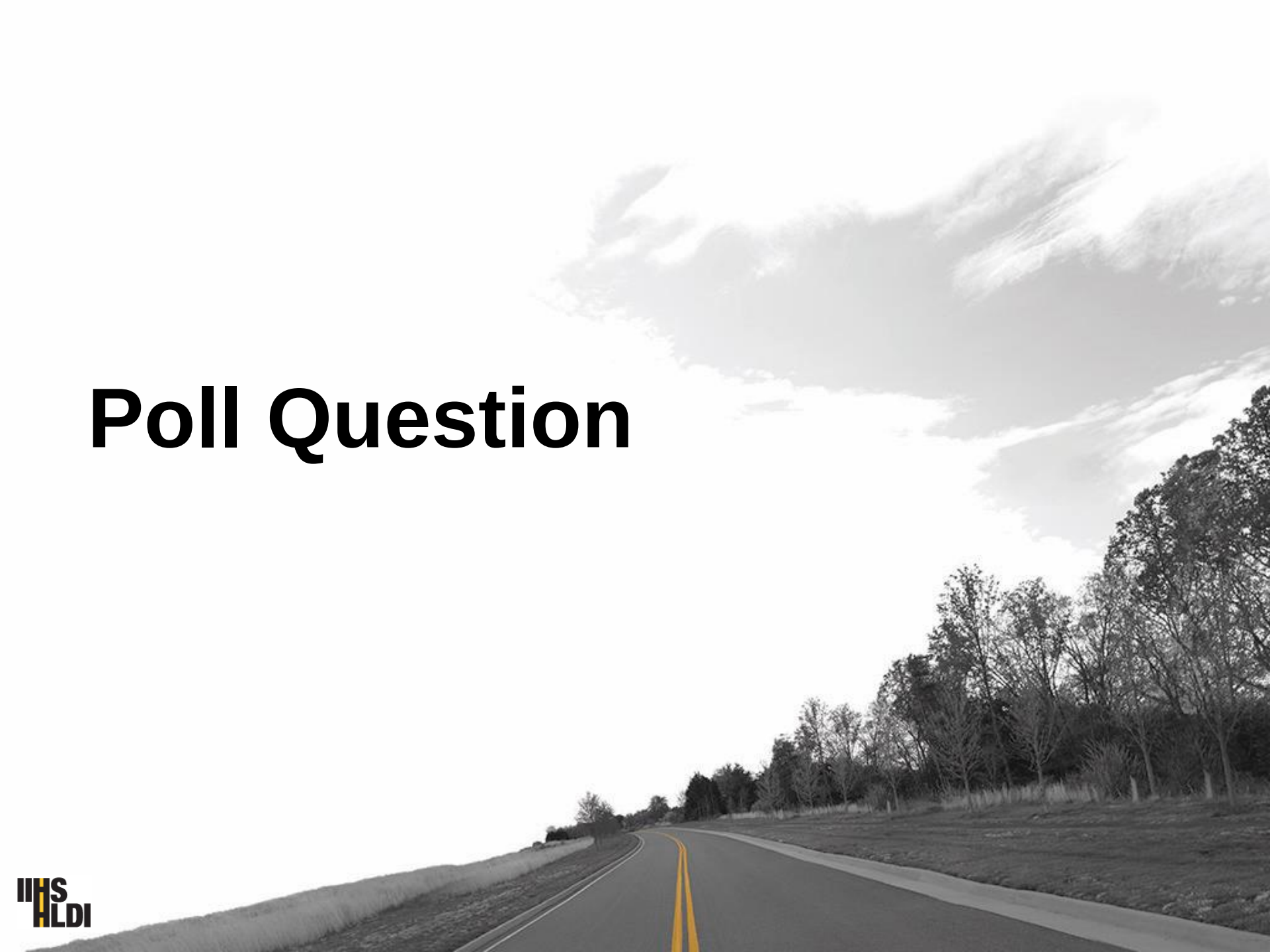
iihs.org

- **IIHS** is an independent, nonprofit scientific and educational organization dedicated to reducing the losses — deaths, injuries and property damage — from crashes on the nation's roads.

- **HLDI** shares this mission by analyzing insurance data representing human and economic losses from crashes and other events related to vehicle ownership.

- Both organizations are wholly supported by auto insurers.

Poll Question



Prevalence of distraction-affected fatal crashes

- 35,092 crash fatalities, United States 2015
- 3,477 fatalities from 3,196 distraction-affected crashes; 476 fatalities from crashes involving cellphone use
- Young drivers (under 30) are overrepresented in distraction-affected fatal crashes
  - Drivers aged 15-19: 7 percent of drivers in all fatal crashes, 9 percent of distracted drivers in fatal crashes, 14 percent of drivers using a cellphone in fatal crashes
  - Drivers aged 20-29: 24 percent of drivers in all fatal crashes, 27 percent of distracted drivers in fatal crashes, 33 percent of drivers using a cellphone in fatal crashes

Distraction is not reliably coded in crash data

- 2013 NHTSA study examined 379 crashes involving 653 vehicles that were common to 3 crash data base programs
- NASS-GES: police reports
- NASS-CDS: police reports, vehicle and crash scene investigation, and driver interviews
- NMVCCS: in depth on-site crash causation survey

distraction?	NASS-GES	NASS-CDS	NMVCCS
yes	11%	14%	28%
no	60%	46%	48%
unknown	30%	40%	24%

Information from police crash reports can be too imprecise for some research applications

- Some coded information is unreliable
  - Injury severity codes are unreliable and often inconsistent with codes assigned by medical personnel
  - Unobservable or unverifiable information on pre-crash driver state or behavior (e.g., driver distraction) is suspect
- NHTSA estimated 60 percent of property-damage-only crashes and 24 percent of injury crashes were not reported to police in 2010
- It is likely that crash databases are inaccurate about the role of distracted driving in motor vehicle collisions

Observational research estimates prevalence of distracted driving behaviors as a function of age

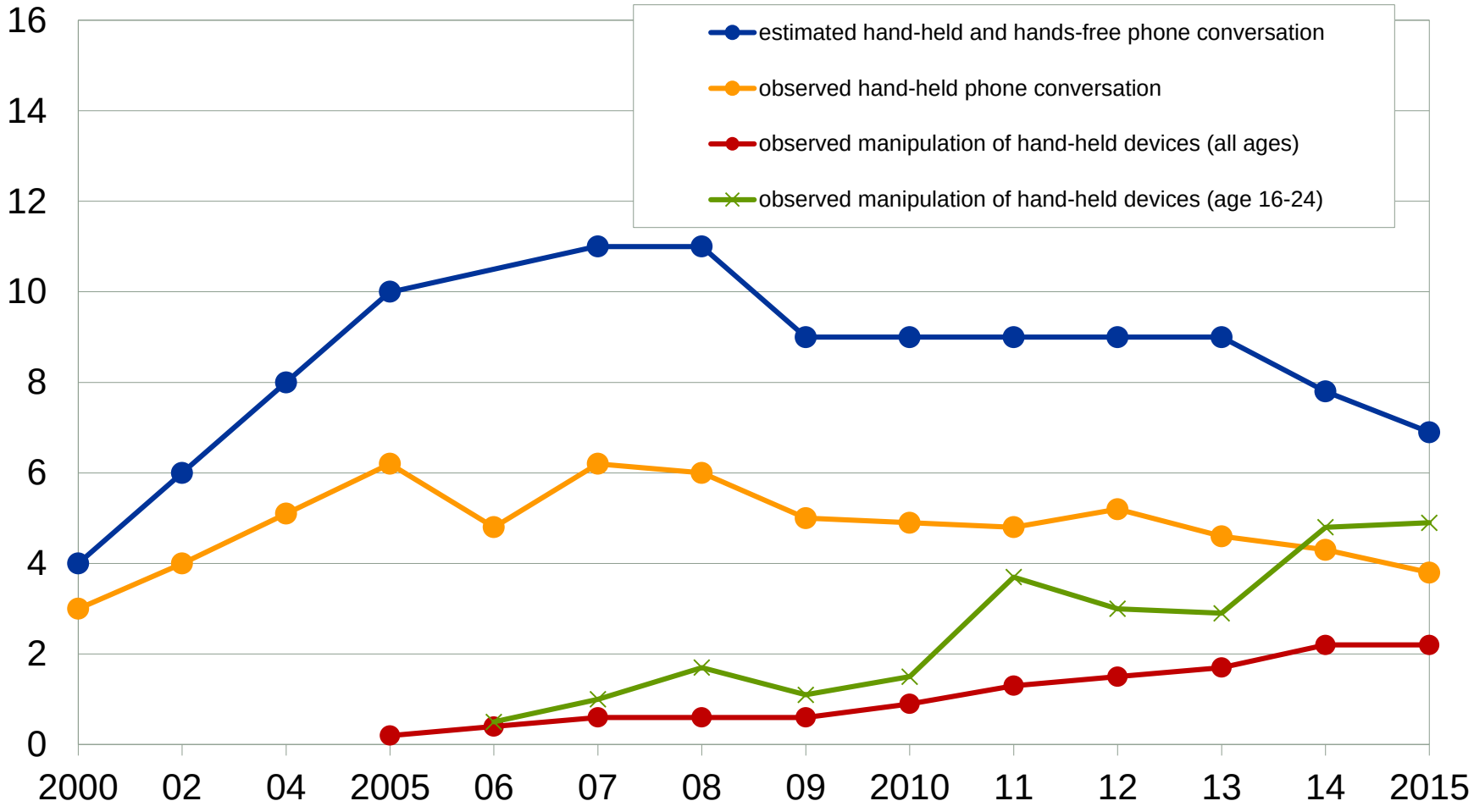
- Roadside observational studies
- Open-road driving studies include field operational tests, field experiments, and naturalistic driving studies
  - Vehicle instrumentation and video provide precise information about vehicle kinematics, driver behavior, and driving environment

    Field operational tests: how do drivers react to a new technology?

    Field experiments: researcher asks participants to complete different tasks while driving

    Naturalistic driving studies: researcher studies drivers day-to-day driving

Percent U.S. drivers using cellphones at any given daylight time, 2000-15



Distracted driving extends beyond cellphone use

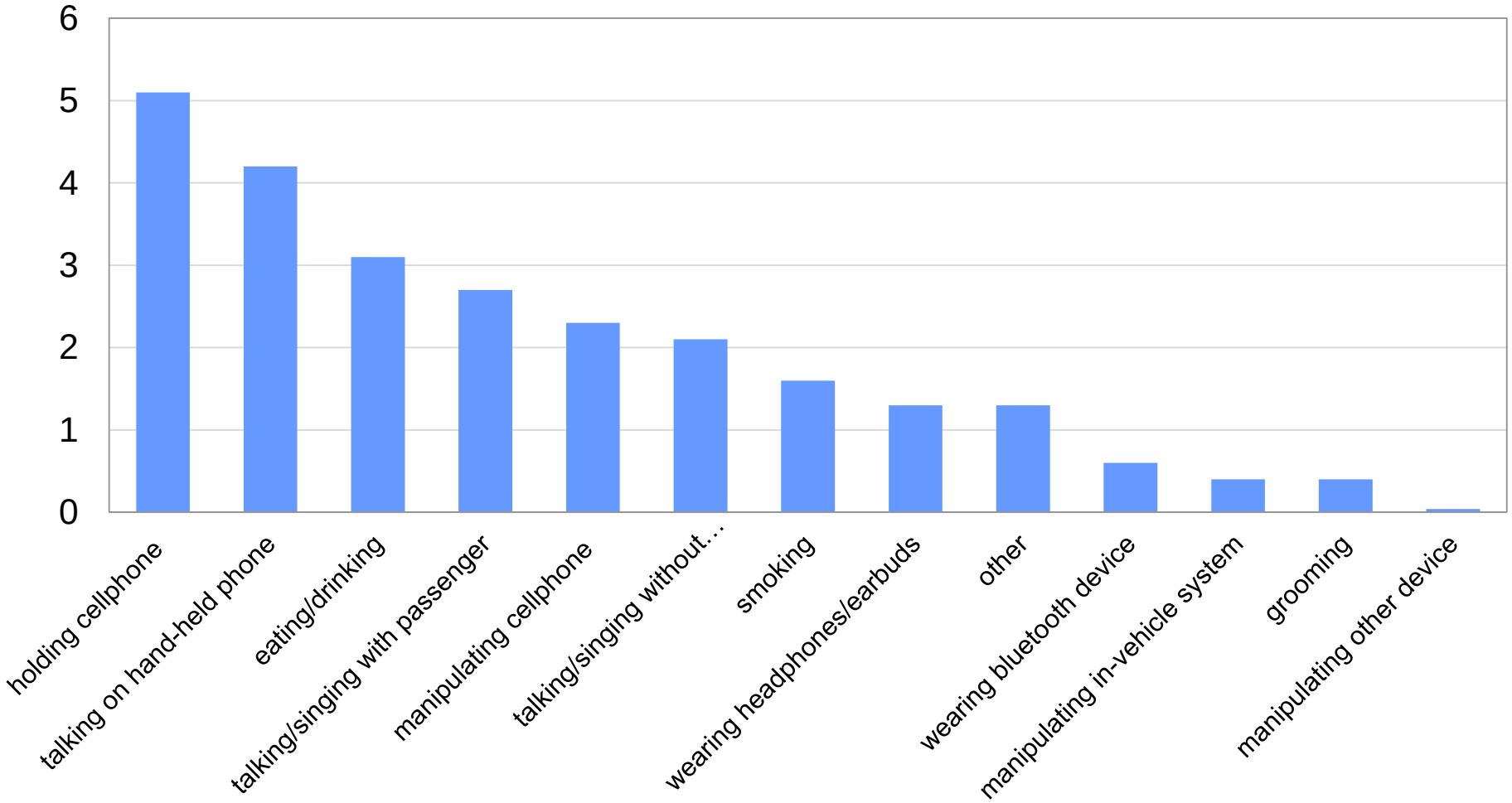
Drivers engage in numerous types of secondary behavior



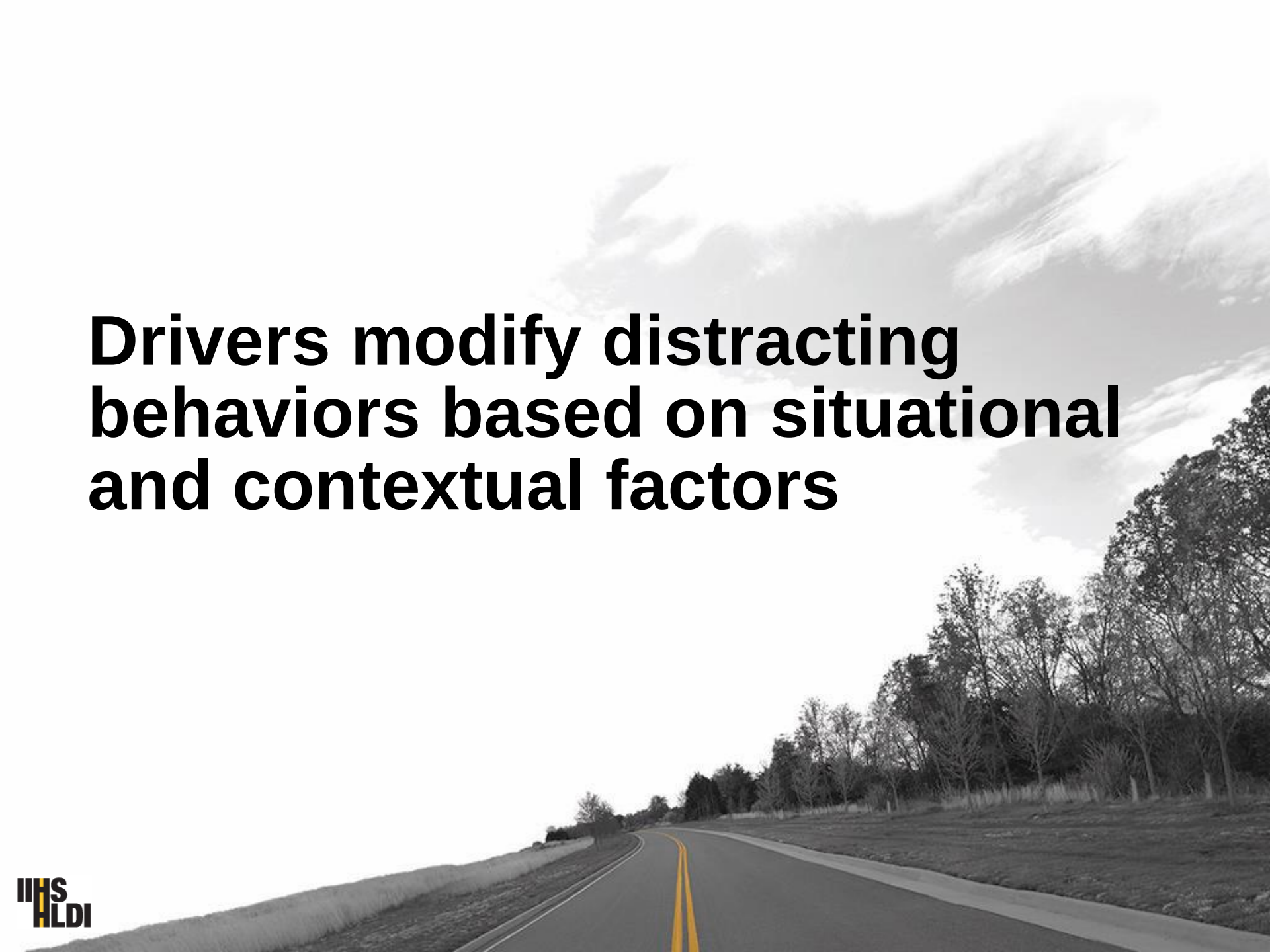



Prevalence of 13 distracting behaviors among Northern Virginia drivers

Percentage of vehicles observed

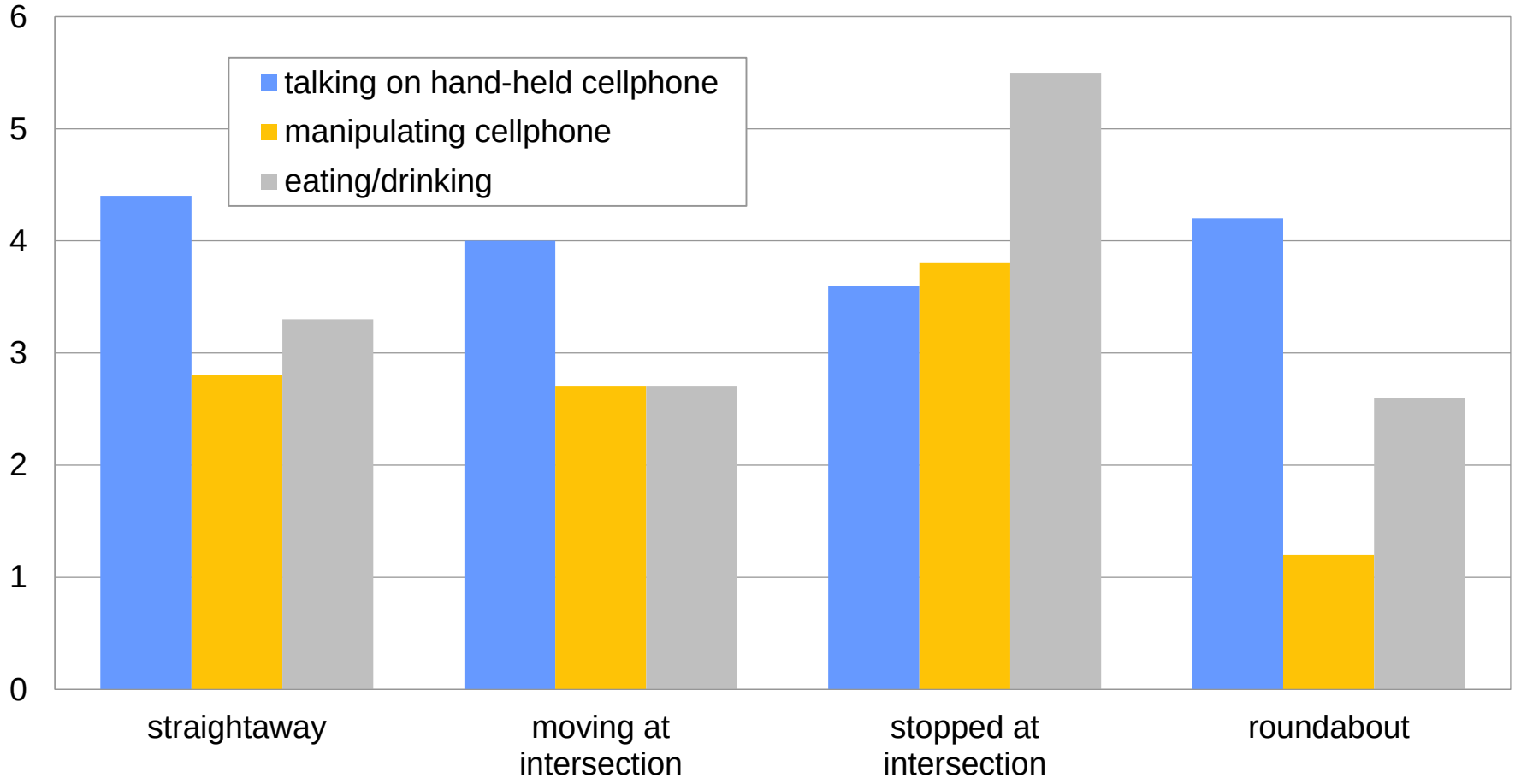


Drivers modify distracting behaviors based on situational and contextual factors

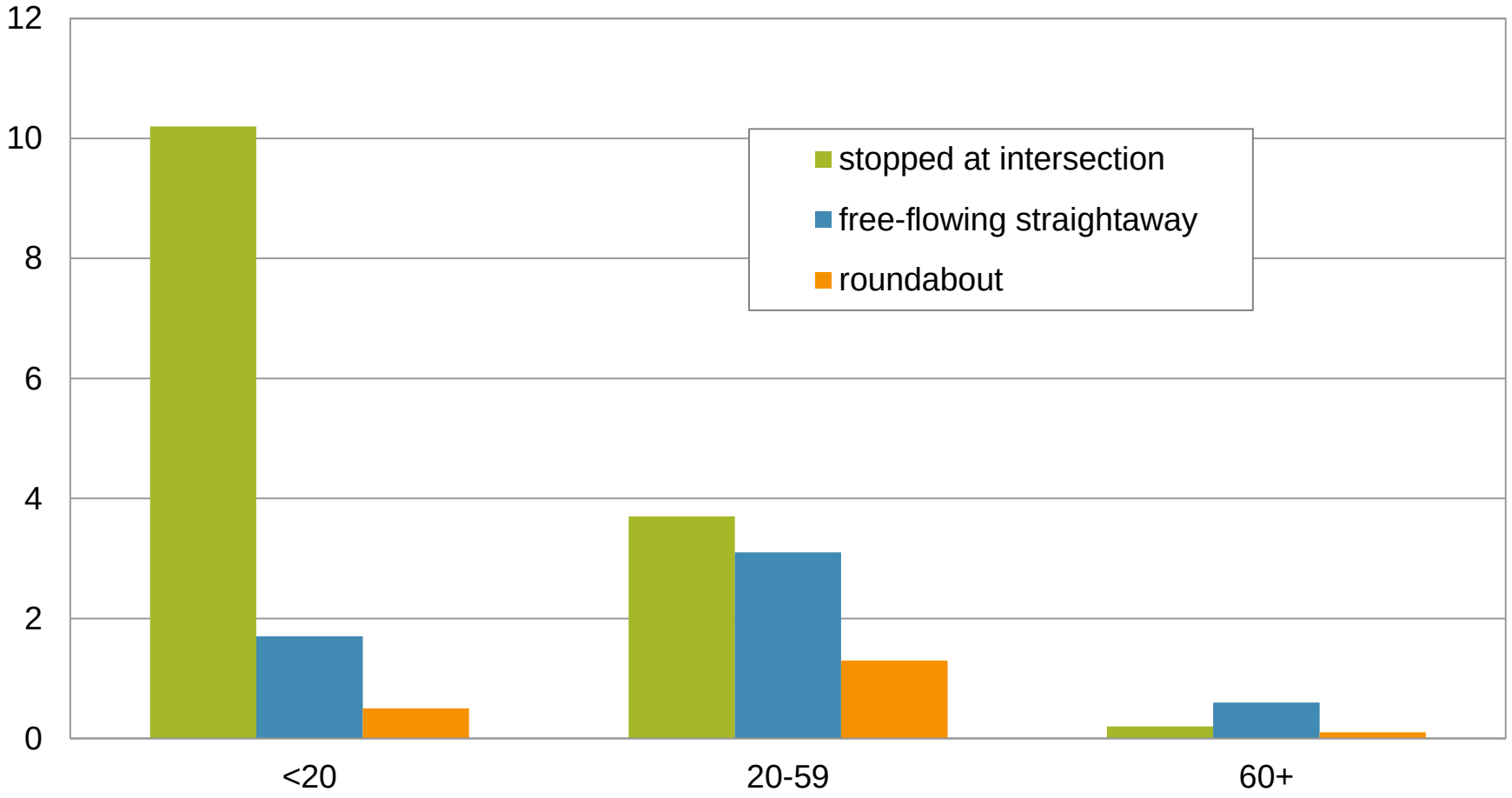


Visual-manual distracting behaviors more common in less-demanding roadway situations

Percent of drivers engaged in specific distracting behaviors



Proportion of drivers observed manipulating a cellphone by situation and estimated age



Estimating crash risk from naturalistic driving studies is challenging

Naturalistic driving yields detailed information when crash occurs but method has limitations

- Early studies used small samples – time and cost considerations
  - Estimate risk by comparing presence of behavior during crash to presence of behavior during 'baseline' driving
  - Most crashes were minor and not reported to police

    Only 15 of the 82 crashes in the first naturalistic (100-car) study were reported to police
  - Because most studies include few crashes, other safety critical events have been used as crash surrogates

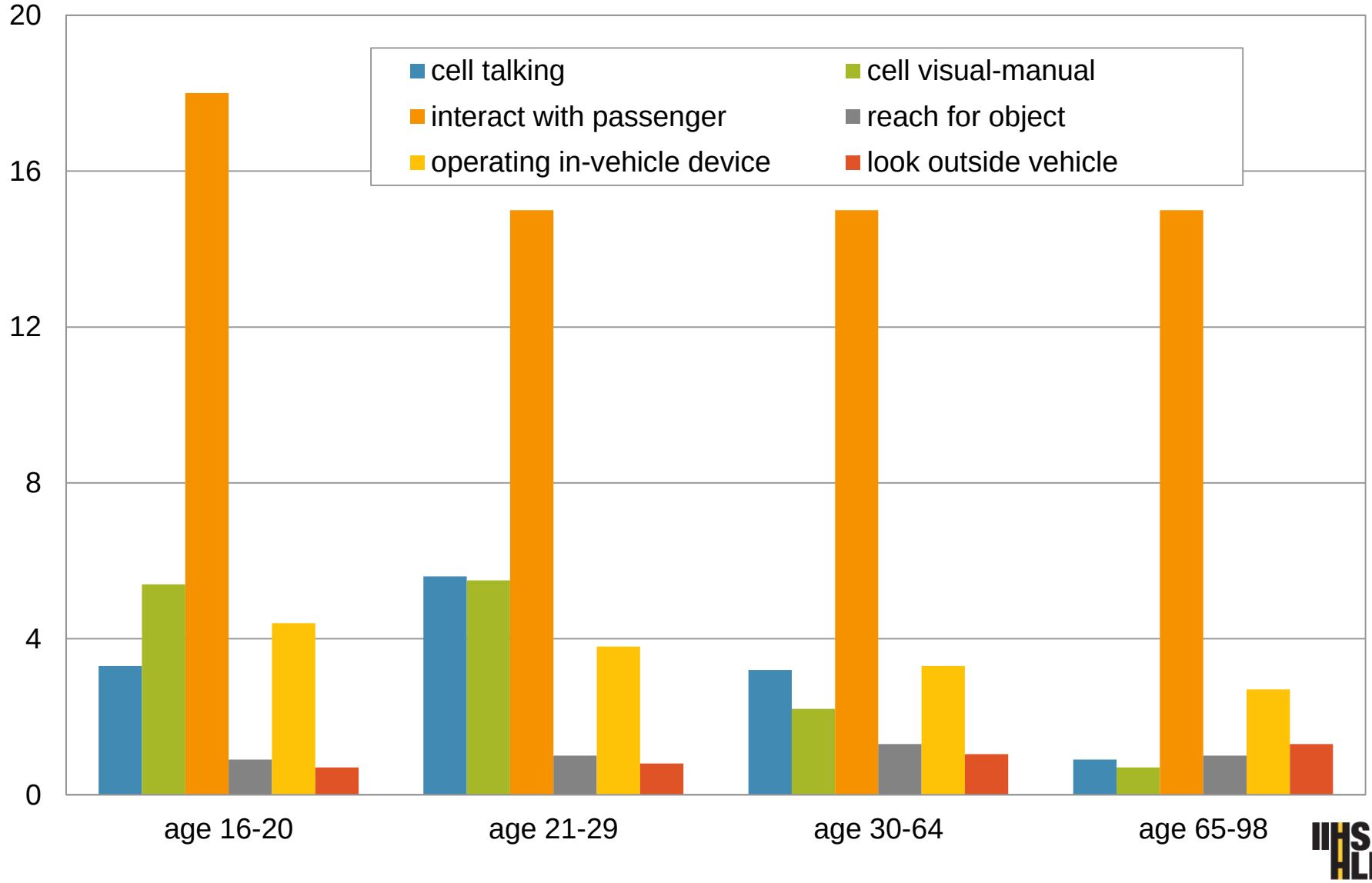
    Risk estimates from early studies are for involvement in crash OR **near crash**

    Surrogates may differ importantly from crashes and may underestimate crash risk

Estimating crash risk associated with distracting behaviors as a function of driver age

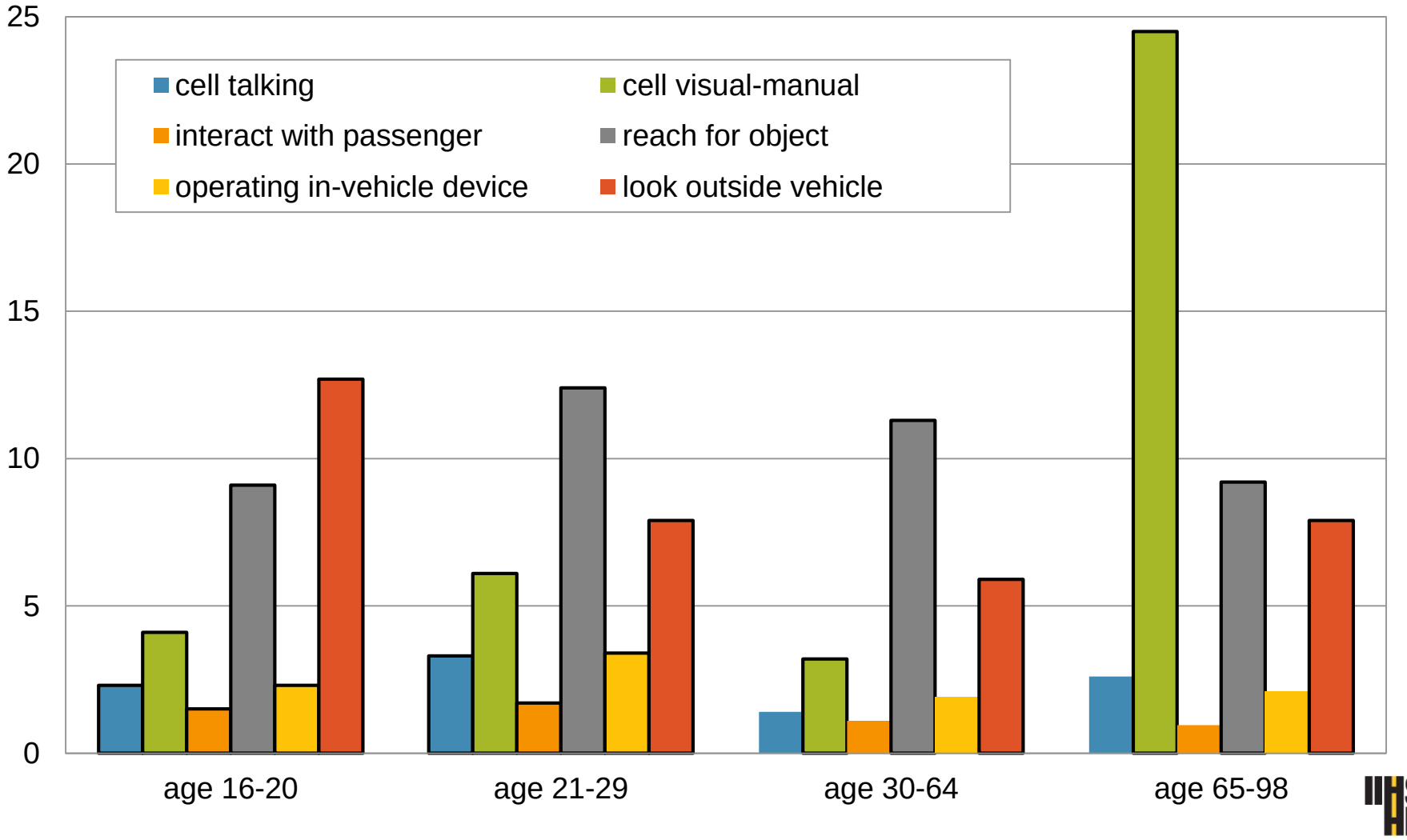
- 2nd Strategic Highway Research Program (SHRP2) Naturalistic Driving Study is largest to date
  - 3,000 U.S. drivers recorded for up to 3 years during 2010-13
  - 1,465 crashes: Majority were not severe: 42% were curb strikes; 41% were minor and unlikely to be reported to police
- Guo et al., 2016 examined crash risk associated with distraction in 905 property damage or higher severity crashes in SHRP2
  - Estimated prevalence of behavior by sampling number of clips of driving proportional to total amount of driving by a participant
  - Estimated crash risk by comparing presence of distraction in the seconds leading to and during crash to periods when the driver wasn't distracted

Percentage of non-crash video clips with different distracting behaviors present (from Guo et al., 2016)



Odds of crash involvement from engagement in six secondary behaviors relative to driving without distraction

Adapted from Guo et al. (2016)



Conclusion

- Distracted driving is not limited to cellphone use
- Teens are overrepresented in distracted driving fatalities, despite the unreliable nature of investigating distraction
- Roadside observations and instrumented vehicle studies show teens and young adults are more likely to engage in distraction and that drivers adjust their behavior based on driving context
- Large reduction in duration of off-road glances during first year of driving underscores the importance of driving experience
- SHRP2 naturalistic driving research
  - Significant crash risk for teens for behaviors with low visual demand (talking on phone, interacting with passengers)
  - Significant crash risk for all drivers for visually demanding tasks, including reaching for object and looking outside vehicle

Insurance Institute for Highway Safety
Highway Loss Data Institute

More information and links to our YouTube channel and Twitter feed at iihs.org

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Distraction and Hazard Perception Training for Young Drivers

Dennis Thomas, Ph.D.

Dunlap and Associates, Inc.

Novice Driver Attention and Perception Deficiencies

- Novices DO NOT pay attention to the road
- Novices DO NOT look in the right places
- Novices DO NOT receive pertinent information
- Novices DO NOT perceive threats
- Novices DO NOT project ahead
- Novices DO NOT react properly

SO……

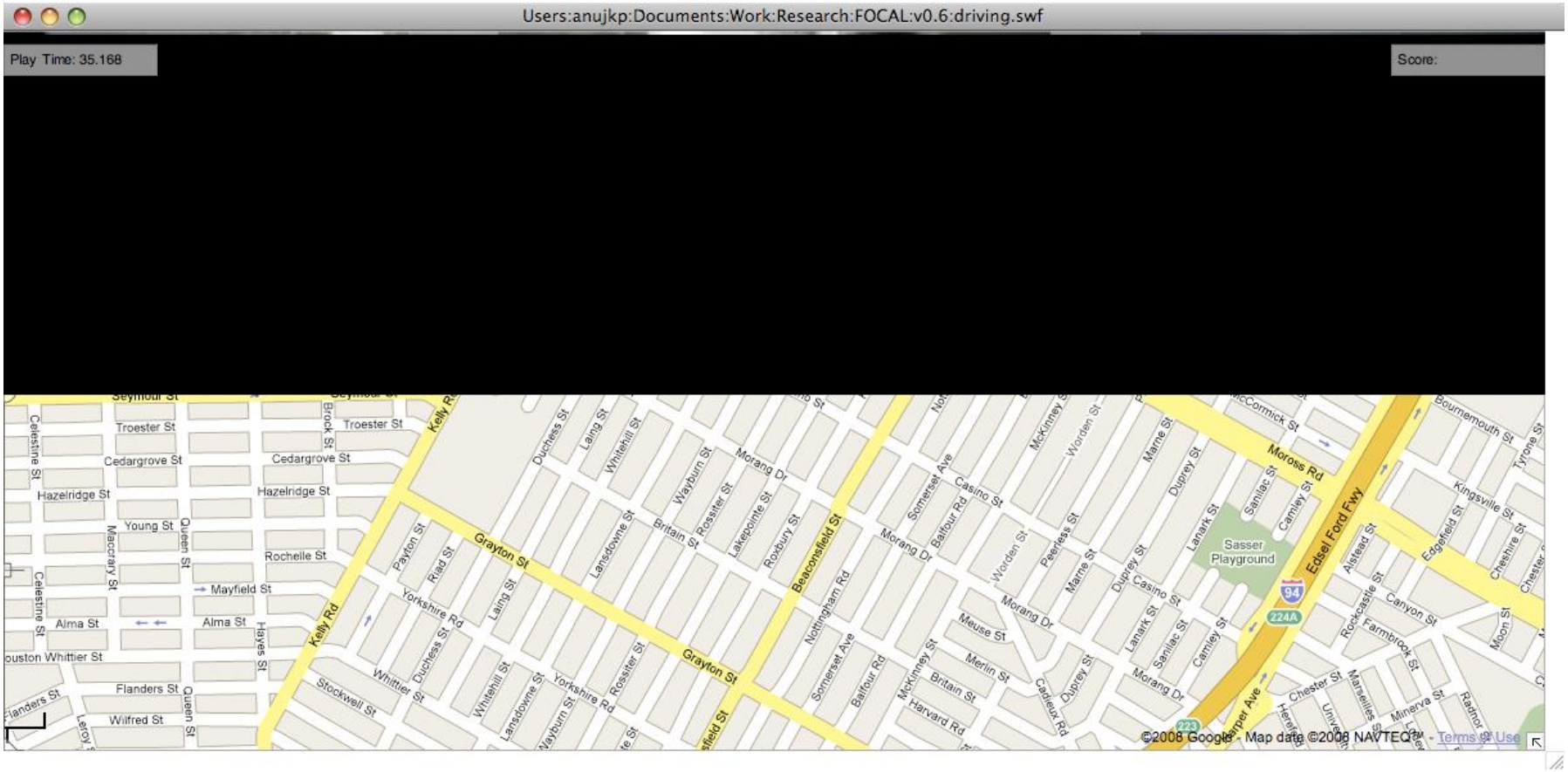
- How do you overcome these deficiencies?

Training to Look at the Road

- FOrward Concentration and Attention Learning (FOCAL) developed by UMass Amherst
- Teaches teen drivers what a 2-second or less glance feels and looks like
- Complete a “driving task” while also completing a “map task”
- One task blacked out while doing other

FOCAL: Road View

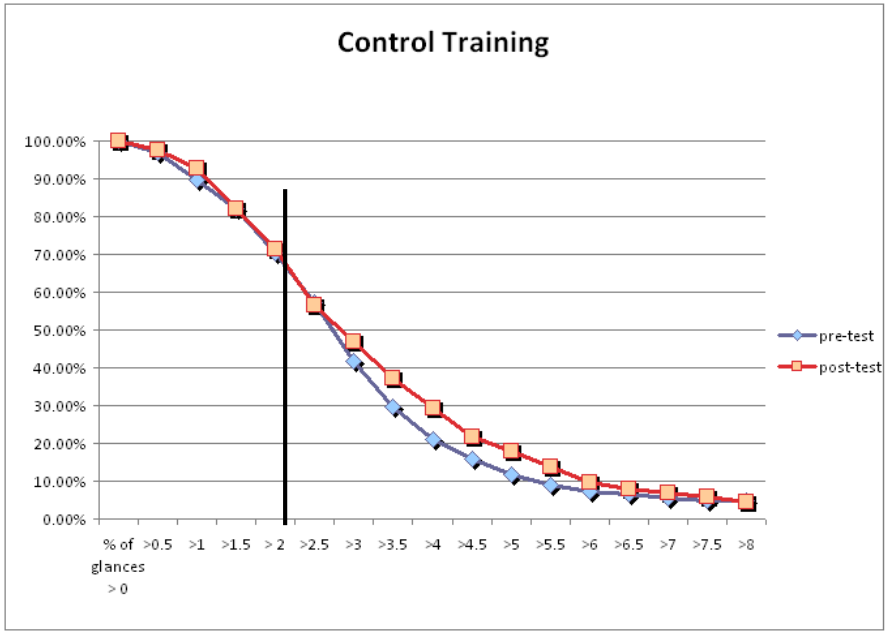
FOCAL Map View

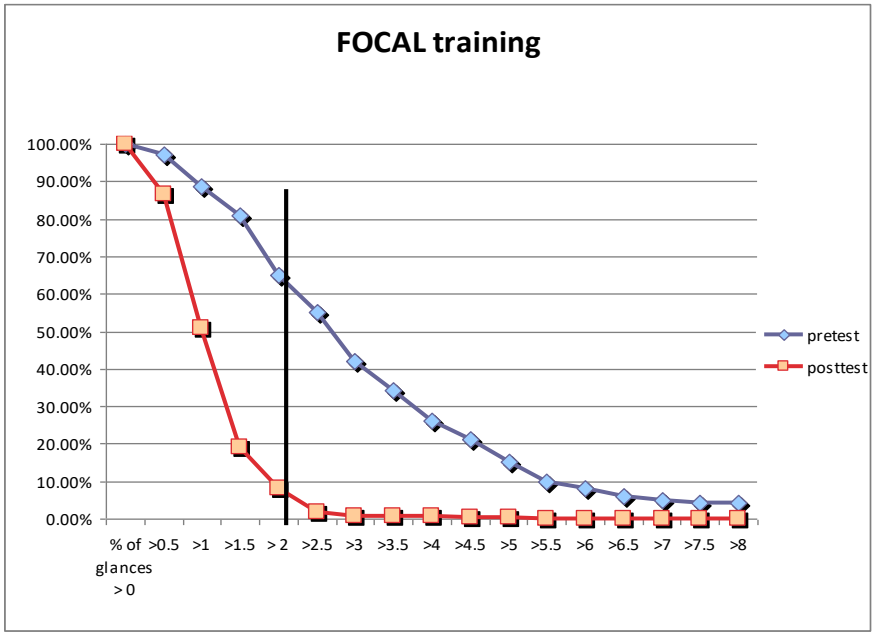


FOCAL

- Pre-test, training, post-test
- Feedback/replay of long glances away from road (show what you missed)
- 1st training section switches views automatically to show what a short glance is
- 2nd training section “beeps” when look away too long to remind you to look up
- Trains to 3 and 2 second durations

FOCAL Computer Test Results





Thomas, F.D., Pollatsek, S., Pradhan, A., Divekar, G., Blomberg, R.D., Reagan, I. and Fisher, D. (2011). *Field and Simulator Evaluations of a PC-based Attention Maintenance Training Program*. (Report No. DOT HS 811 469). Washington, DC: National Highway Traffic Safety Administration.

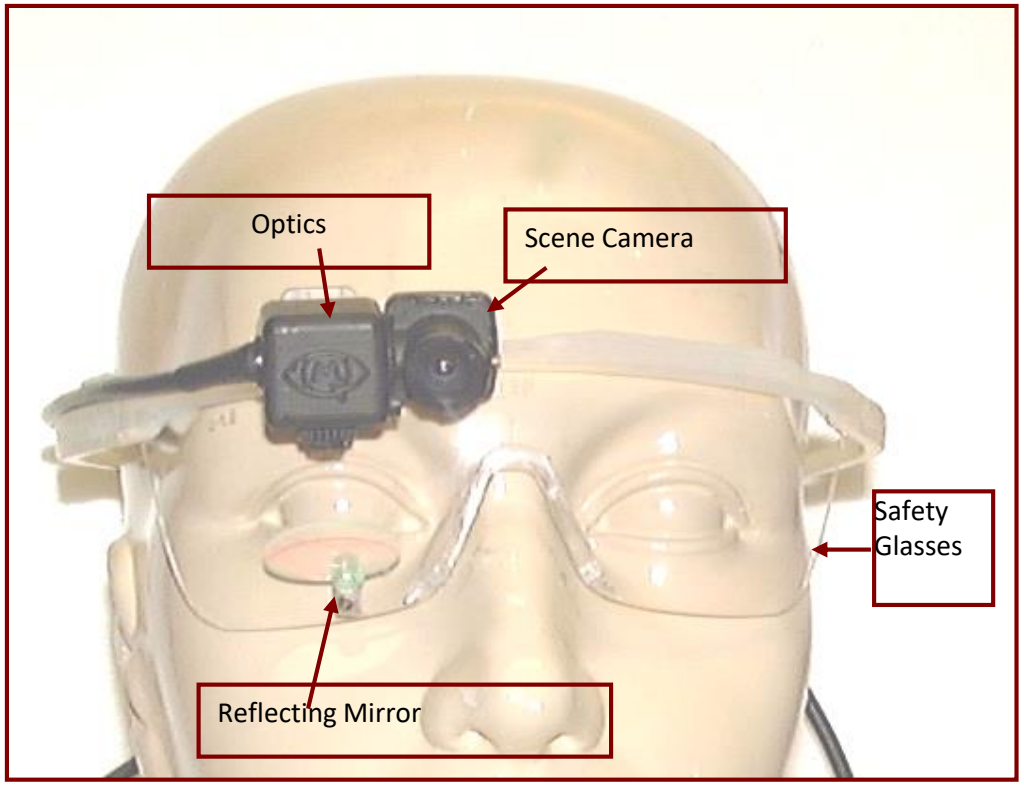
Focal Field Test

- Take teens out on live roads and have them do distracting tasks

Vehicle/Driving Tasks			Non-Driving Tasks					
High Beams	Front Defroster	Emergency Flashers	Find CD 1	Map Task 1	Find Radio Station	Map Task 2	Find CD 2	Find Correct Change

- Driving instructor in dual control car
- Use eye tracker to see how long they look away from road during tasks

Wearable Eye Tracker



FOCAL Field Test Results

Vehicle Tasks

Group	Max Glance (seconds)	% of Tasks With Glance > 2 s
FOCAL	2.42	59.6%
Placebo	2.67	63.9%
Placebo − Focal	0.25	4.2%

Non-Vehicle Tasks

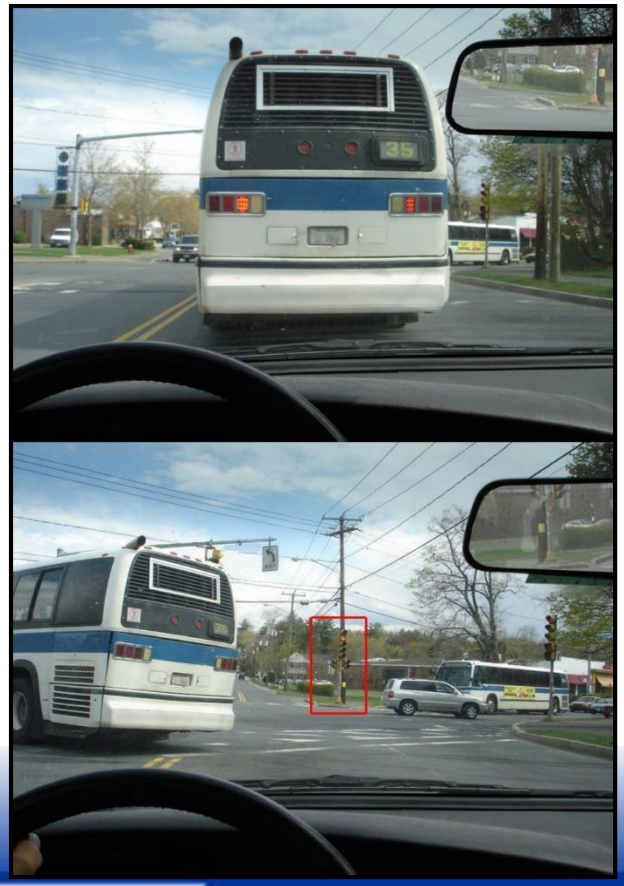
Group	Max Glance (seconds)	% of Tasks With Glance > 2 s
FOCAL	2.53	59.5%
Placebo	3.07	75.9%
Placebo − Focal	0.54	16.5%

Conclusions

- A short training program does appear to have some positive impact on glance behaviors
- No large scale studies of effectiveness to reduce crashes
  - It's unknown if this training actually impacts young driver safety

Training Hazard Perception Skills

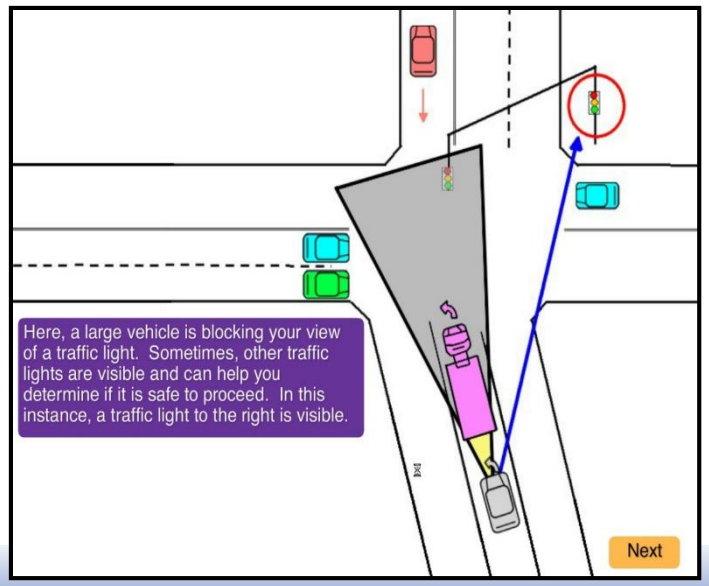
- Risk Awareness and Perception Training

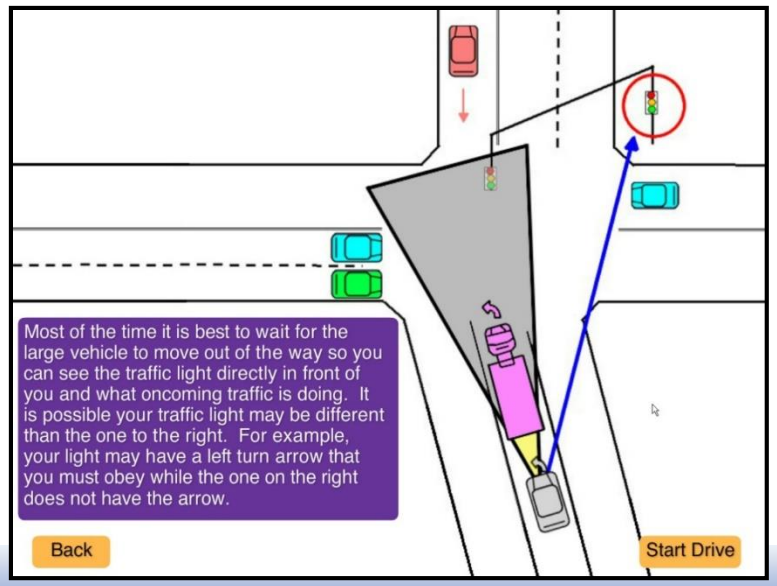


- Used still frames
- Click where looking
- Buttons to look Left or Right

Original RAPT

- Overhead views to tell you where to look
- Pre-test, Training, Post-test





Large-Scale Field Test

- Over 5,000 teens in California

Treatment Group	Sex	Age (years)	Crash Rate Per 100 Drivers
Control	Male	16	8.0
		17	12.9
		18	11.6
	Female	16	9.6
		17	5.2
		18	8.3
RAPT	Male	16	9.6
		17	7.4
		18	7.5
	Female	16	9.4
		17	6.3
		18	10.0

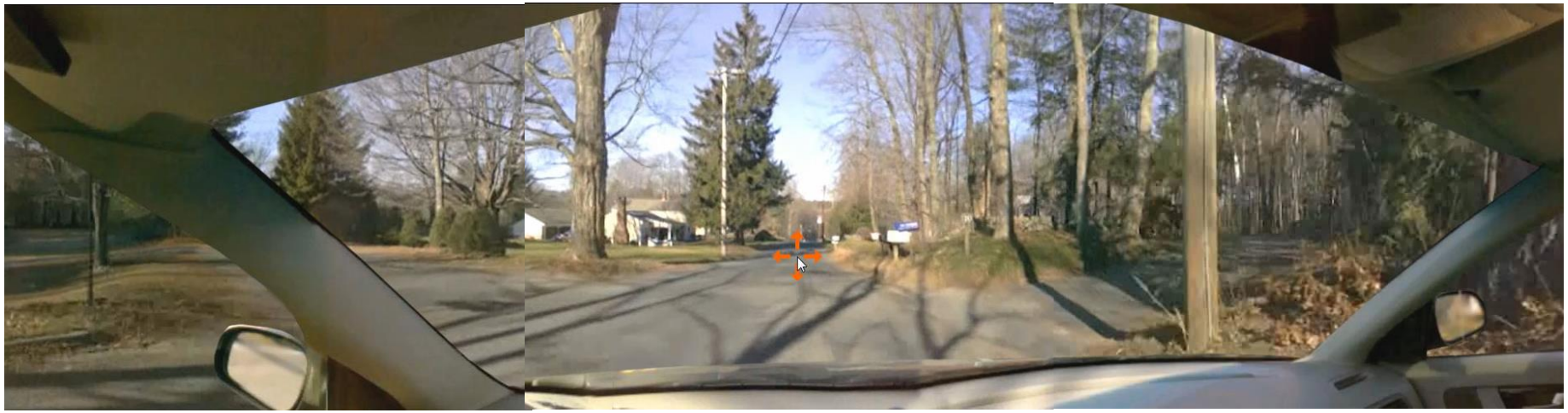
Thomas, F. D., Rilea, S. L., Blomberg, R. D., Peck. R. C., & Korbelak, K. T. (2016). *Evaluation of the safety benefits of the risk awareness and perception training program for novice teen drivers* (Report No. DOT HS 812 235). Washington, DC: National Highway Traffic Safety Administration.

Large-Scale Field Test

- Crash results suggested RAPT associated with a significant decrease in crash rate *for males*
- Females exposed to RAPT showed a higher crash rate relative to comparison females (non-significant)

"Super" RAPT (sRAPT)

- Updated graphics
- 5 high definition videos integrated
- Can pan 180 degrees

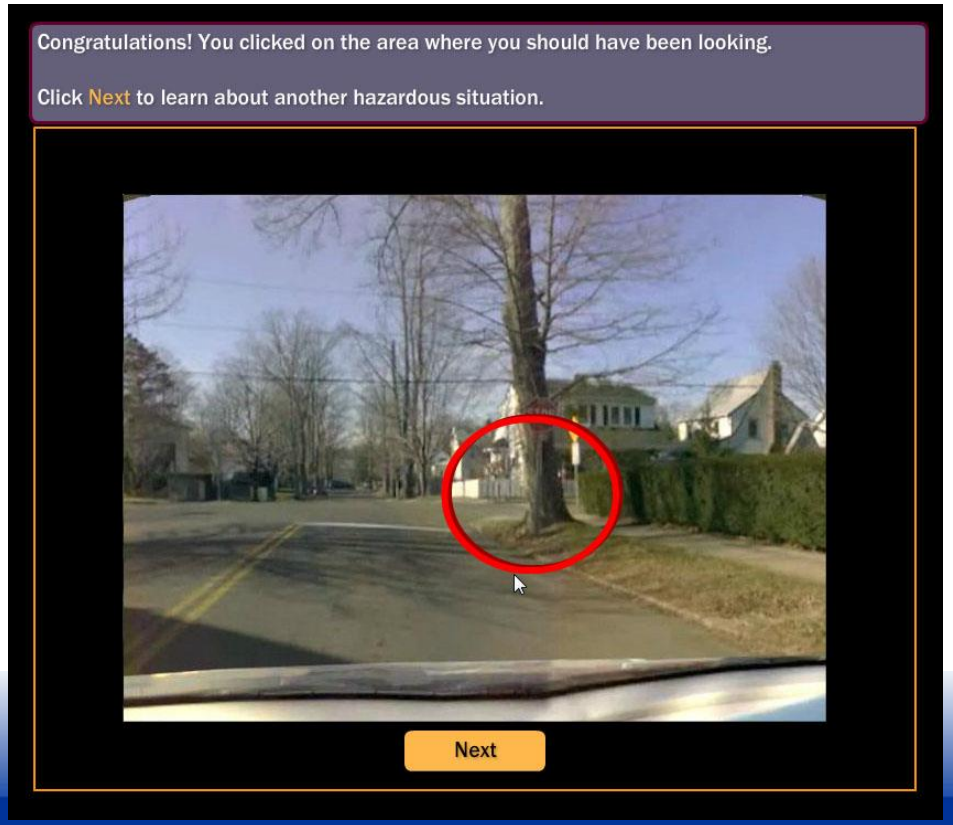


Thomas, F. D., Korbelak, K. T., Divekar, G. U., Blomberg, R. D, Romoser, M. R. E. & Fisher, D. L. (2017). Evaluation of an updated version of the risk awareness and perception training program for young drivers (Report No. DOT HS 812 379). Washington, DC: National Highway Traffic Safety Administration.

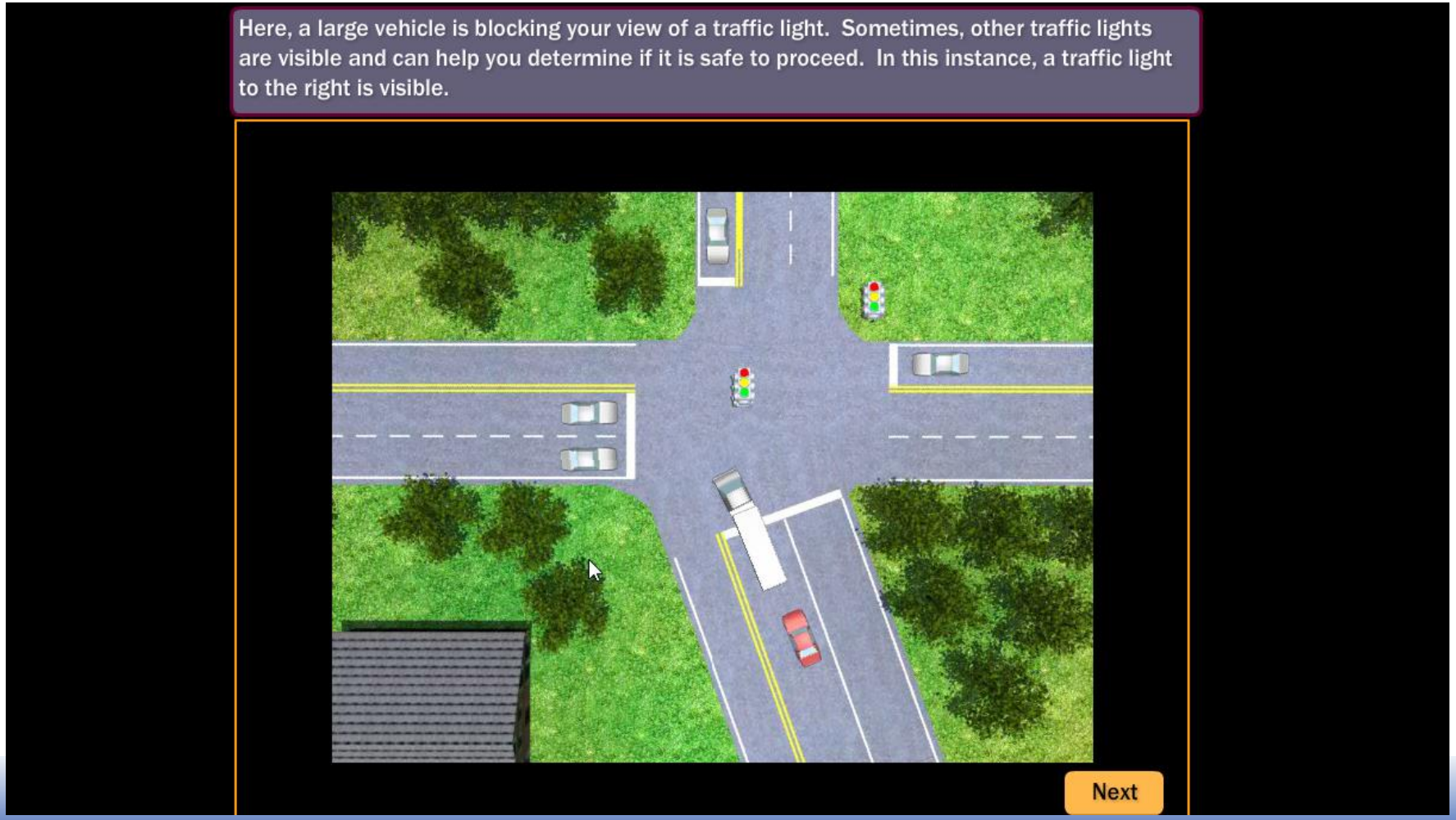
sRAPT

- New animations and simulations

- Feedback added



sRAPT Example

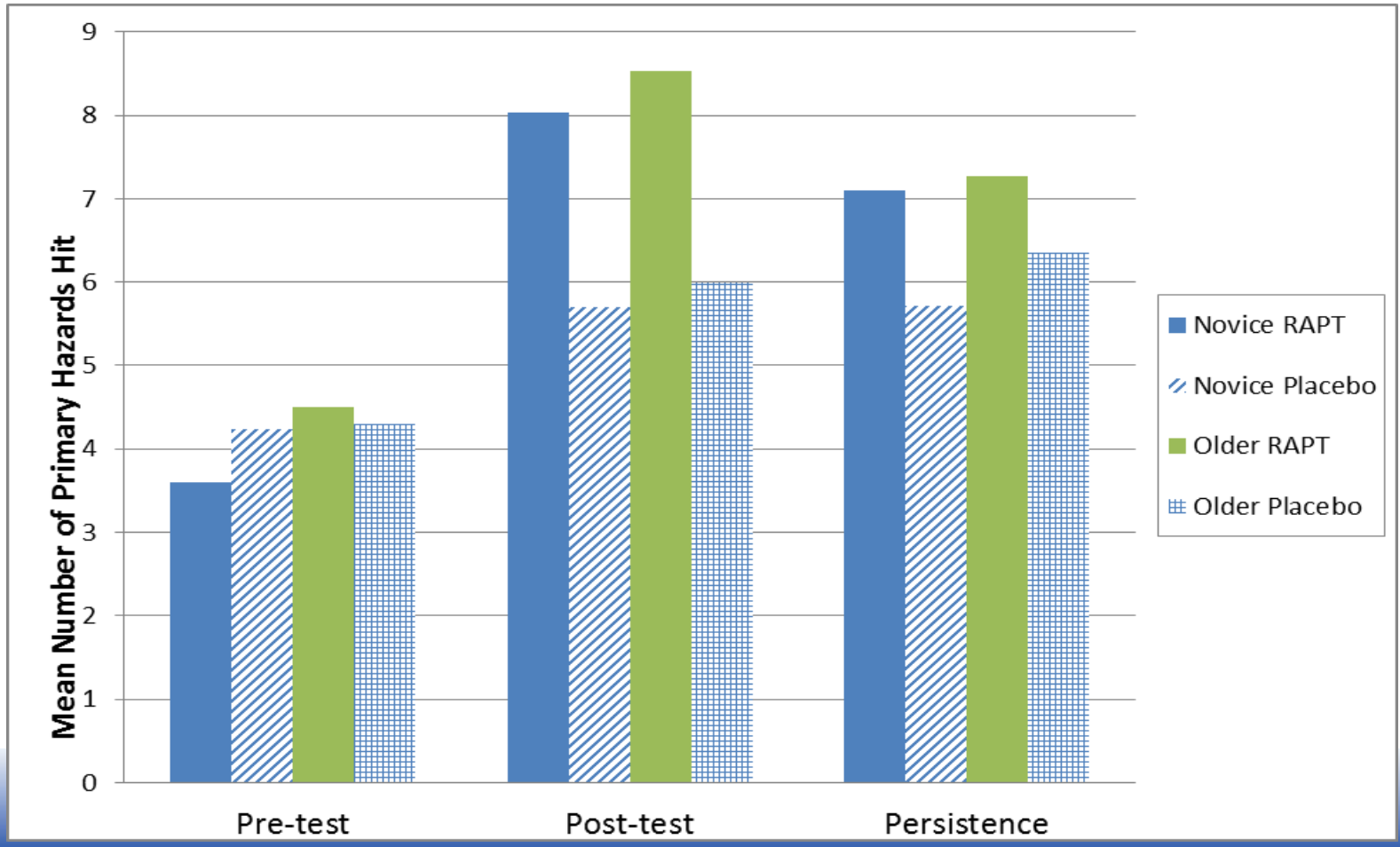


sRAPT Example

sRAPT Example

sRAPT Study Results

- Computer Test: Number of hazards recognized



sRAPT Study Results

- Field drive with eye tracker: Hazard areas focused on out of 25 possible

Training Group	Age Group	Mean
RAPT	Novice	18.96
	Older	18.97
Placebo	Novice	14.55
	Older	16.09

Conclusions

- A short computer program can be used to teach novices to better anticipate hazards
- RAPT appears to be related to a crash reduction for males
- Attention maintenance and hazard perception appear to be independent constructs
- Unknown how these programs would work as a part of a driver education program

Contact Information

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Questions

Please enter your questions in the Q & A box

Thank you!

Please fill out our short evaluation:
https://www.surveymonkey.com/r/9CXD3RW