TRB Webinar: Improving Teen Driver Safety

October 28, 2025

2:00 – 3:00 PM (eastern)

PDH Certification Information

1 Professional Development Hour (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

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Purpose Statement

This webinar will discuss the results from two BTSCRP reports that used naturalistic driving data to gain a broader understanding of the risks facing teen drivers.

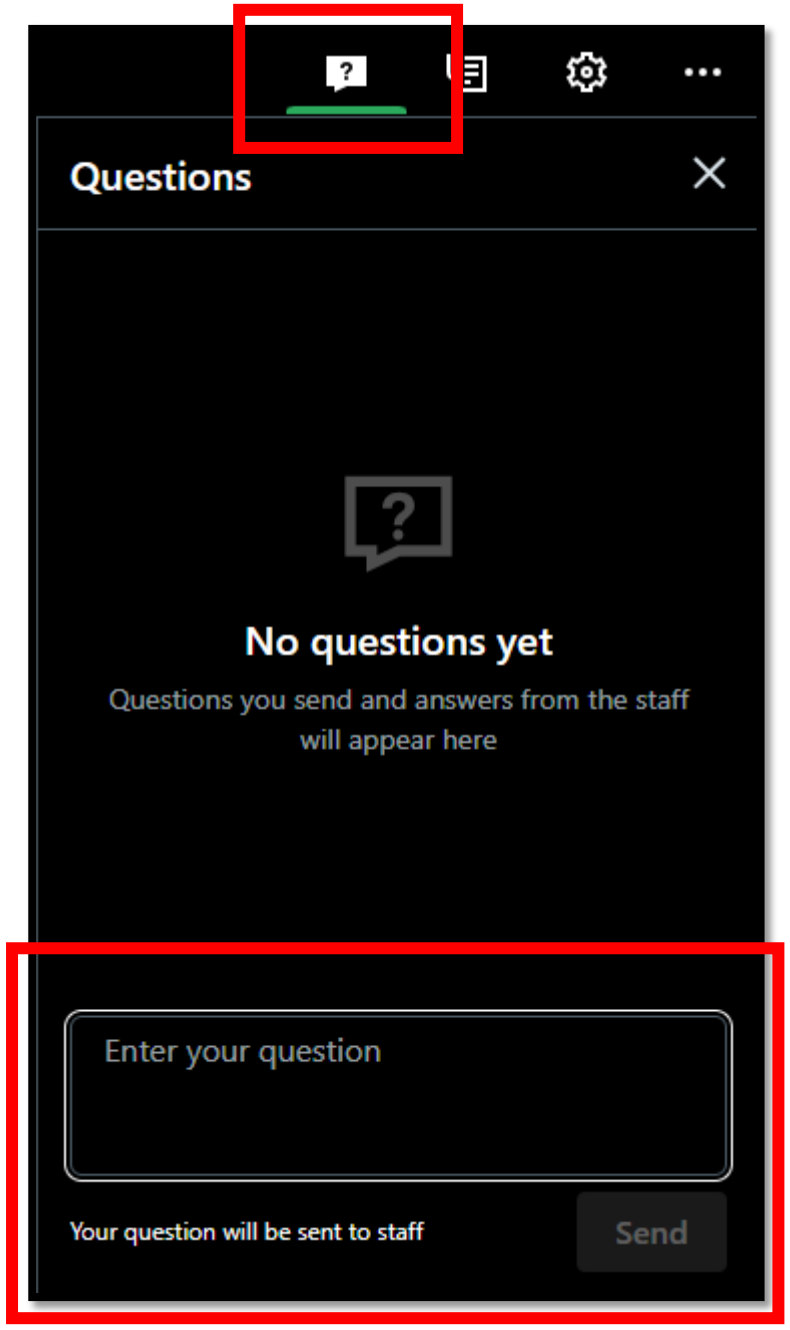
Learning Objectives

At the end of this webinar, participants will be able to:

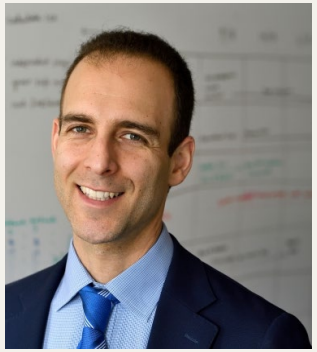
- Connect of the amount of supervised practice driving and exposure to many different types of roadway environments to safety outcomes during independent driving
- Identify the risk of “eyes off road” time by phases of driving experience

Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



Today's presenters



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Improving Teen Driver Safety Webinar

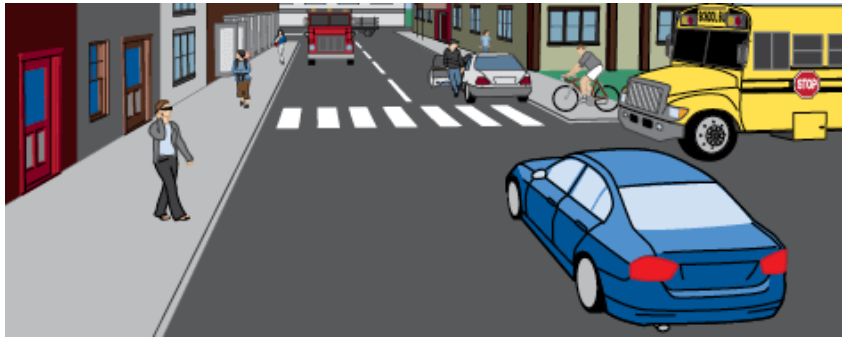
Presentation of BTS-23 and BTS-28

Speakers: Dr. Charlie Klauer & Dr. Lesheng Hua
Moderator: Dr. Johnathon Ehsani

BTSCRP-23 Outcomes of Variability in Teen Driving Experience and Exposure: Results from NDS

Dr. Charlie Klauer, PI
Dr. Johnathon Ehsani, Co-PI
Dr. Loren Staplin, Co-PI
Lesheng Hua

TRB Webinar



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Research Opportunity

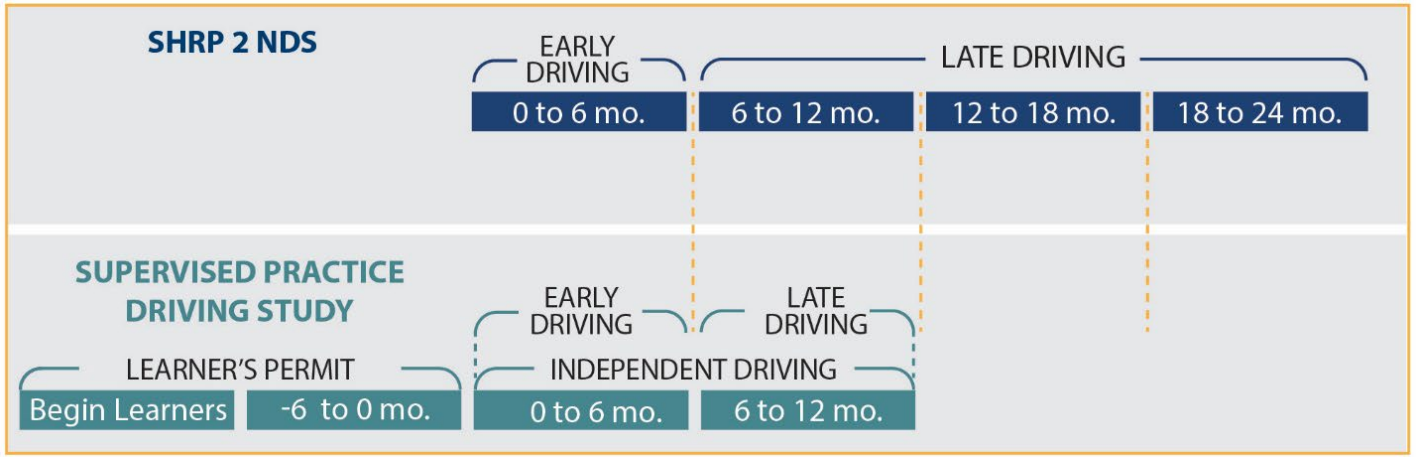
- 2020 Crash data:
  - **2,560 teenagers ages 15–19 were involved in fatal crashes**
- Recent research suggests:
  - Teens with training in a broad range of driving environments = fewer crashes
  - Consistent driving practice rather than intensive practice right before examination = 39% reduction in crash risk in first year of independent driving
- More research needed to understand relationship between variability of exposure and driving diversity during learner and early independent driving stages and safety outcomes in later driving

Research Objectives 1 and 2

1. Evaluate how exposure to driving in diverse traffic and road environments **earlier in the learning-to-drive process:**

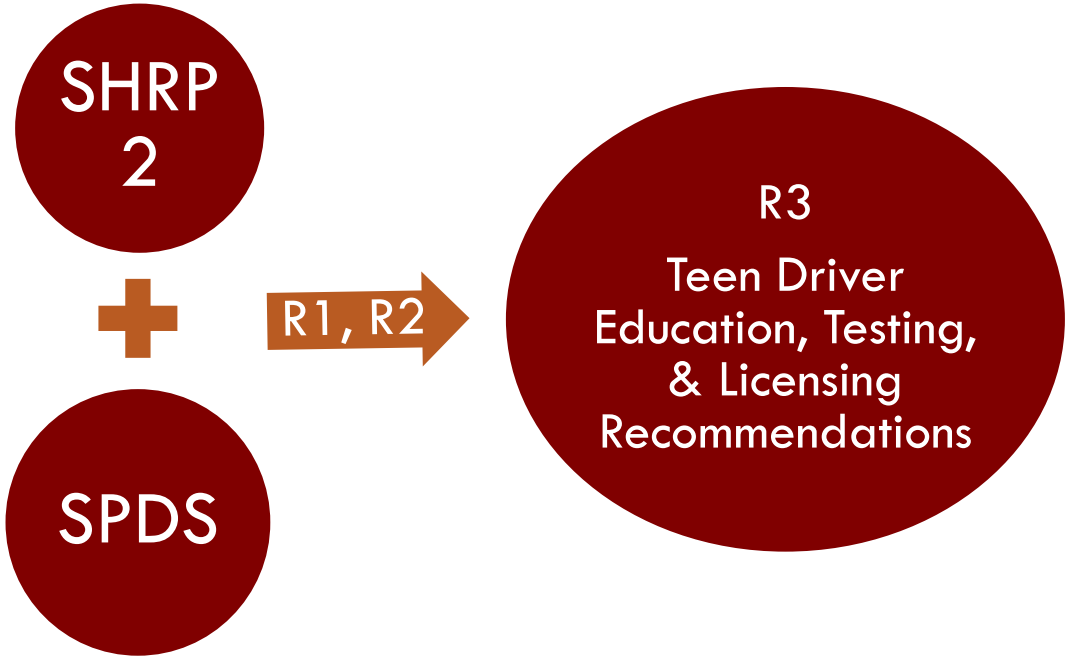
    1. Is associated with crashes and/or other safety surrogates (e.g., near-crashes, elevated g-force events) in later driving.

    2. Is associated with variability in teen driver behavior or safety-relevant performance measures in later driving, corrected/normalized for exposure.



Research Objective 3

2. Develop recommendations/strategies for improving teen driving safety for State Highway Safety Offices.



Methods

- Two naturalistic driving datasets— the Second Strategic Highway Research Program NDS (SHRP 2) and the NIH-funded Supervised Practice Driving Study NDS (SPDS NDS)—were employed to evaluate how exposure to driving in more diverse traffic and road environments earlier in the learning to drive process is associated with teen driver behavior in later driving.

	SHRP 2	SPDS
Participants	254	82
Age at Recruitment	16.7 (target age – not required for participation)	15.6 (required for participation)
Licensure Stage	Independent	Learner and Independent
Miles	1,800,000	490,000
Crashes	149	69

Methods: Data Coding

- Similar procedures were used for both SPDS and SHRP2 NDS for
  - Identifying safety critical events (SCEs)
  - Coding key variables for SCEs
  - Selection and coding of baseline, control segments

- Only two types of SCEs were used in these analyses
  - **Crash**: Any contact that the subject vehicle has with an object, either moving or fixed, at any speed. Also included are non-premeditated departures of the roadway where at least one tire leaves the paved or intended travel surface of the road.
  - **Near-crash**: Any circumstance that requires a rapid evasive maneuver by the subject vehicle, any other vehicle, pedestrian, cyclist, or animal to avoid a crash.

Methods: Variables

Independent Variables:

- Driving Phase
- Driving Exposure
- Functional Road Classification
- Route Familiarity/Frequency
- Vehicle Ownership (Primary/Secondary)
- Time of Day, Day of Week
- Gender

Dependent Variables:

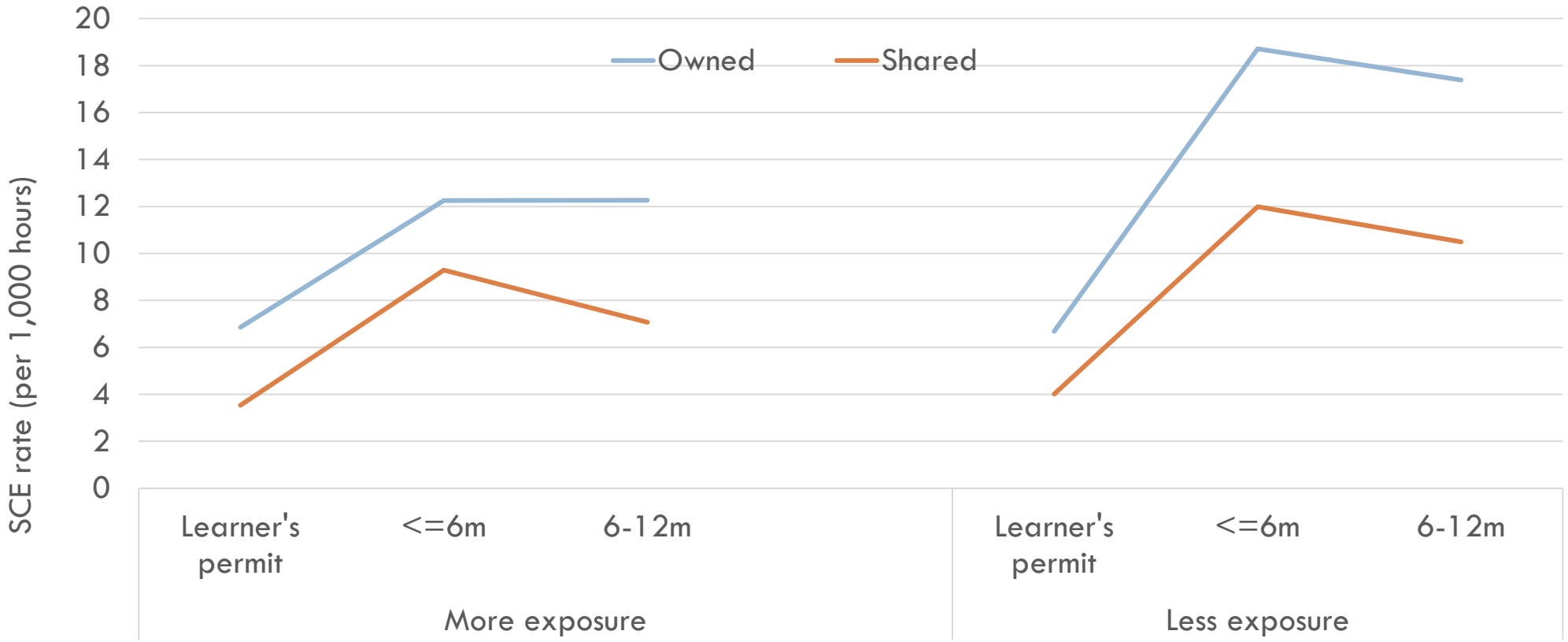
- Crash/Near-crash Rates
- Kinematic Risky Driving Rates
- % Time Speeding

Results: Total amount of supervised practice driving

- A related analysis of total hours of supervised practice driving indicated that **approximately half of the participants** in this study actually practiced the 45 required hours of supervised practice driving, as regulated by the state of Virginia.
  - These combined results suggest that state regulated number of hours of supervised practice driving will result with at **least half of the teens not getting the full number of hours of supervised practice** driving much less any other requirement such as set number of hours of driving at night.
  - Given this result, **adding requirements for parents/teens to use electronic logging cell phone apps** to help keep track of the amount of practice they are getting may help improve compliance and improve the number of hours of practice that teens actually get during the supervised practice driving phase.

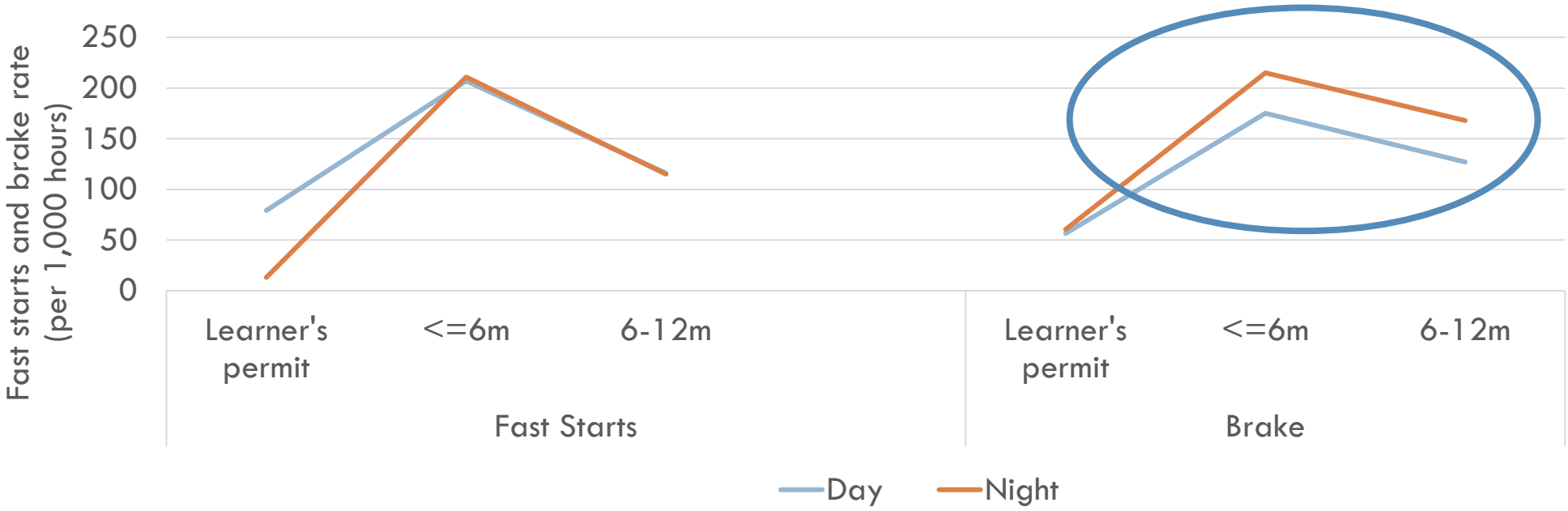
Results: Teens with more practice have lower SCE rates during independent driving

Using SPDS NDS data and state-of-the-practice Poisson regression models, teens with more driving exposure during learner's permit phase have lower crash/near-crash rates than do novice teens with less driving exposure during learner's permit phase.



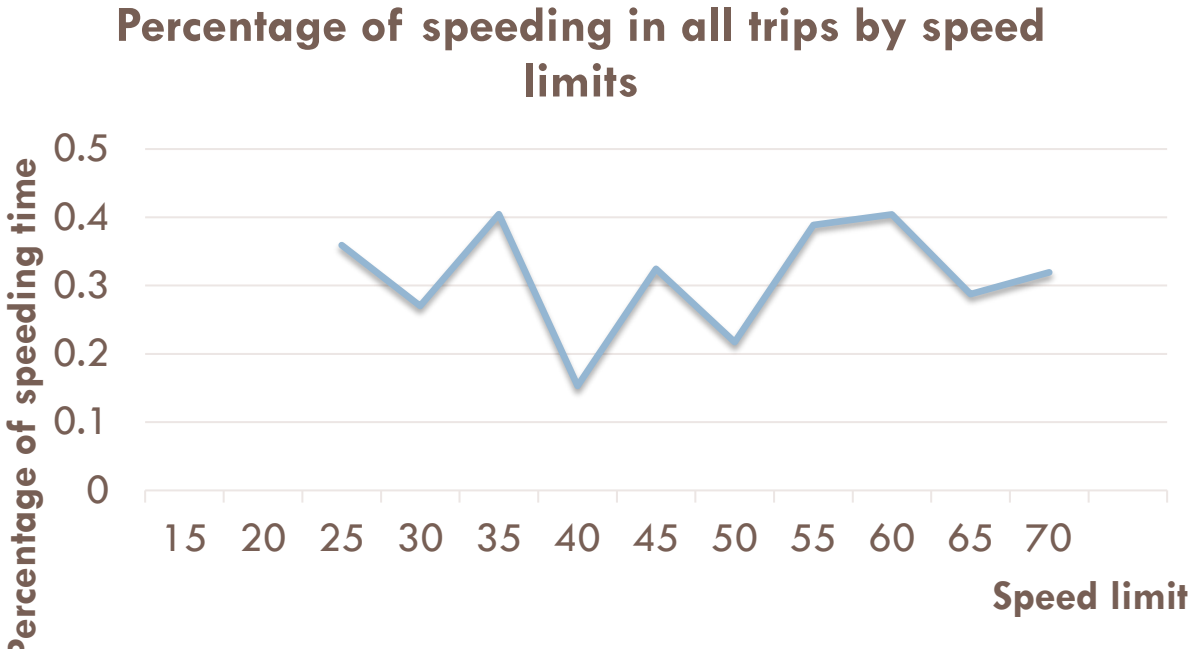
Diversity of Driving Experience

The lack of practice at night during supervised practice driving was highlighted by the significant increase in hard braking events at night during independent driving. This strongly suggests that teens need more practice during nighttime hours during supervised practice driving.



Key Findings

- The percentage of trips where parents ride with their teen drivers once their teen is driving independently is abysmally low. Results also indicated that teens who received less practice also drove independently more alone or with teen passengers than with adults riding in the car than did teens with more practice.
- High prevalence of speeding amongst teen drivers, especially at the 25-35 MPH range.



Implication for Policy and Practice

- Given that teens demonstrate different driving behaviors on familiar versus unfamiliar routes, **parent should be encouraged to practice driving with their teenagers on roads that are new and challenging** when they feel that their teen is ready.
- We found that parents were the primary passengers when teenagers were driving during the learner phase. This corresponded to the period when teenagers' driving was safest. **Parents should keep riding with their teens during independent driving**
- The increased risk associated with nighttime driving and hard braking behaviors also underscores the importance of parents **enforcing the nighttime supervised practice driving requirements for teenagers** as well as **GDL nighttime driving restrictions** when they have their license to drive independently.
- The high prevalence of speeding that was observed among teenager across various speed limits, particularly at 25 and 55+ mph, suggests **a need for stronger enforcement of speed limits using automated enforcement**, particularly in areas with lower speed limits where crashes can be severe.

Thank You!

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BTSCRP-28 Teen Driving Performance Associated with Distraction, ADHD, and Other Risk Factors

Lesheng Hua
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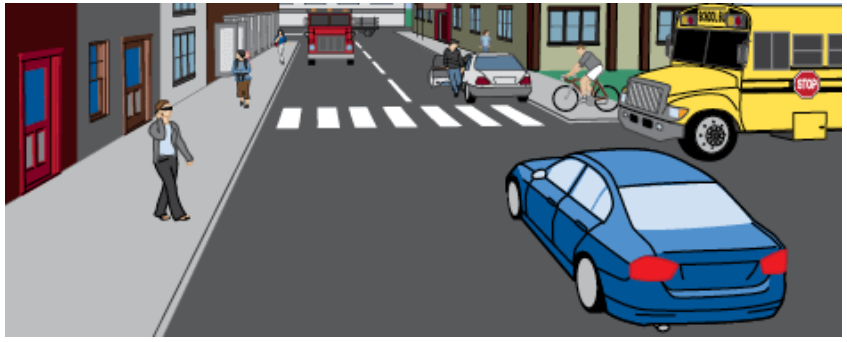
Taylor Linkous
Shu Han
Allison Curry

TRB seminar



Research Opportunity

16-year-old novice driver have higher crash/near-crash risk when performing secondary tasks than adult drivers engaging in the same activities (Klauer et al., 2014)

- Inexperience
- Inattention
- Risky behavior
- ADHD

Eyes off Road(EOR):

- Crucial mechanism for inattention
- Critical indicator of crash risk
- EOR metrics
- The longer eyes off road, the greater the crash/near crash risk

ADHD

- Difficulty in attention regulation
- Engage in more secondary tasks
- Take long glance away from the road
- excessive risk of crashes among teen drivers

Research Gaps

- Few studies have directly examined the crash risk of the EOR among teen drivers with:
  - Ages
  - Experience
  - ADHD status

Research Objectives

1. Assess the association between duration of EOR, crash risk, and driving phases

2. Determine how the relationship between the duration of inattention and crash risk changes with age

3. Compare the crash risk of inattention in teen drivers with and without ADHD

Methods: Eyes off Road Risk Analysis

- Baseline events and Crash/near Crash events
- **Eyes off road (EOR):**
  - Total EOR: 1 s, 2 s, 3 s, 4 s, 5 s
  - Single longest EOR: 1 s, 2 s, 3 s, 4 s, 5 s
- **Age:** 16-17 vs. 18-19
- **Driving phases**: first 6 months vs. second 6 months
- **ADHD:** ADHD vs. non-ADHD

	SHRP 2	SPDS
Age	16-19 years	16-17 years
Driving phases	n/a	First 6 months Second 6 months
ADHD	**22**	**n/a**
Non-ADHD	**488**	**82**

Methods: EOR Coding

- **Unit of Analysis**:
  - **Single longest EOR:**

    the duration of the single longest off-road glance during the 6-second window prior to a **Crash/Near-Crash (CNC)** or **Baseline** event
  - **Total EOR:**

    the sum of off-road glance durations during the 6-second windows prior to a **Crash/Near-Crash (CNC)** or **Baseline** event

- **Two duration groups**:
  - ≥ 1s vs. < 1s
  - ≥ 2s vs. < 2s
  - ≥ 3s vs. < 3s
  - ≥ 4s vs. < 4s
  - ≥ 5s vs. < 5s
- **The reference group:** < 1s, < 2s, etc.

Results: EOR Risk was Highest during First 6 Months

- In second six months, drivers showed a lower prevalence of total EOR but a higher prevalence single longest EOR
- Risk increases as EOR duration increases
- Overall, EOR crash risk decreased in second six months

EOR groups	Total EOR		Single longest EOR	
	First 6 Months	Second 6 Months	First 6 Months	Second 6 Months
≥ 1 s	2.51	1.51	2.84	1.99
≥ 2 s	3.59	2.91		4.96
≥ 3 s	5.71	1.75		
≥ 4 s	11.65	1.49		

Results: EOR Risk Decreases with Increasing Age

- EOR crash risk decreased with increasing age
- Single Longest EOR Glances are more risky than multiple glances of the same duration

EOR groups	Total EOR		Single longest EOR	
	16-17 years	18-19 years	16-17 years	18-19years
≥ 1 s	1.89	1.66	2.20	1.74
≥ 2 s	3.05	2.13	11.03	2.47
≥ 3 s	4.36	2.09	29.89	25.36
≥ 4 s	5.89	1.95	45.38	
≥ 5 s	11.00	2.96	17.51	

Results: EOR Risk in ADHD Group is Lower than in Non-ADHD?

- EOR prior to CNC events occurred in ADHD group less frequently than in non-ADHD group
- EOR crash risk in ADHD is lower than in non-ADHD group
- For drivers with ADHD, EOR crash risk did not increase significantly with longer glance durations

	Total EOR		Single longest EOR	
	ADHD	Non-ADHD	ADHD	Non-DHD
≥ 1 s	1.10	1.74	0.72	1.90
≥ 2 s	0.57	2.42	2.08	4.15
≥ 3 s	0.52	2.73		27.16
≥ 4 s	2.02	2.92		55.04
≥ 5 s		5.63		22.66

Key Findings

- Crash risk increases with longer glance durations
- Crash risk decreases with increasing age and experience, even measurable within the first year of independent driving
- Crash risk in ADHD group is lower than in non-ADHD group

Discussion and Limitations

- Curry et al. (2022): teen drivers with ADHD have a higher crash risk than their peers without ADHD

- **Discussion**
  - Smaller sample size of the ADHD group
  - Two EOR metrics may not fully capture the inattention traits of teen drivers with ADHD

Metrics: Total EOR and Single Longest EOR

- ADHD: Difficulty in fixation control and saccade suppression
  - ADHD teens may not actually be looking away that long but may also not be able to process the forward view in the same way that neurotypical teens do
  - Number of glances away may be higher with this group but this was not analyzed, for example

- **With and without ADHD**
  - Michaelis et al. (2012): No difference in saccadic eye movements and shorter fixation duration between with and without ADHD
  - Groom et al. (2015): No difference in fixation duration
  - Kingery et al. (2015): Significant difference in the number of extended glances away from the roadway exceeding 2 seconds

Implications for Policy and Practice

- Ensure that teen and parent are aware of how risky it is for teen drivers to take eyes off road for even one or two seconds
  - Using cell phone apps to minimize distraction while driving
  - Introduction of driver monitoring systems in new vehicles may potentially help teen drivers

- Requiring parent sessions for novice drivers in potential risk of eye off road

Thank You!

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Barkley's ADHD Quick Screen Questionnaire

Name_____ **Date**_____

Instructions

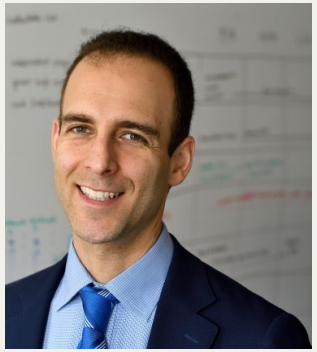
Please circle the number next to each item that best describes your behavior **DURING THE PAST 6 MONTHS.**

Items:	Never or Rarely	Sometimes	Often	Very Often
1. Easily distracted	0	1	2	3
2. Have difficulty organizing tasks and activities	0	1	2	3
3. Lose things necessary for tasks or activities	0	1	2	3
4. Have difficulty awaiting my turn	0	1	2	3
5. Feel restless	0	1	2	3
6. Have difficulty engaging in leisure activities or doing fun things quietly	0	1	2	3

For Office Use:

Add up the scores for each item. Enter Total Score Here _____

Today's presenters



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Upcoming events for you

November 4, 2025

TRB Webinar: Diagnostic Assessments and Countermeasure Selection in the Safe System

https://www.nationalacademies.org/trb/events

January 11-15, 2026

2026 TRB Annual Meeting

https://trb-annual-meeting.nationalacademies.org


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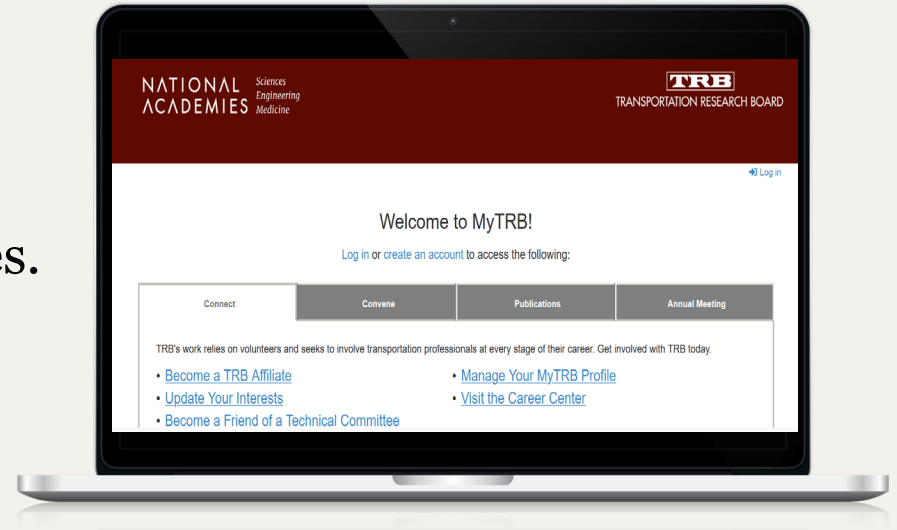

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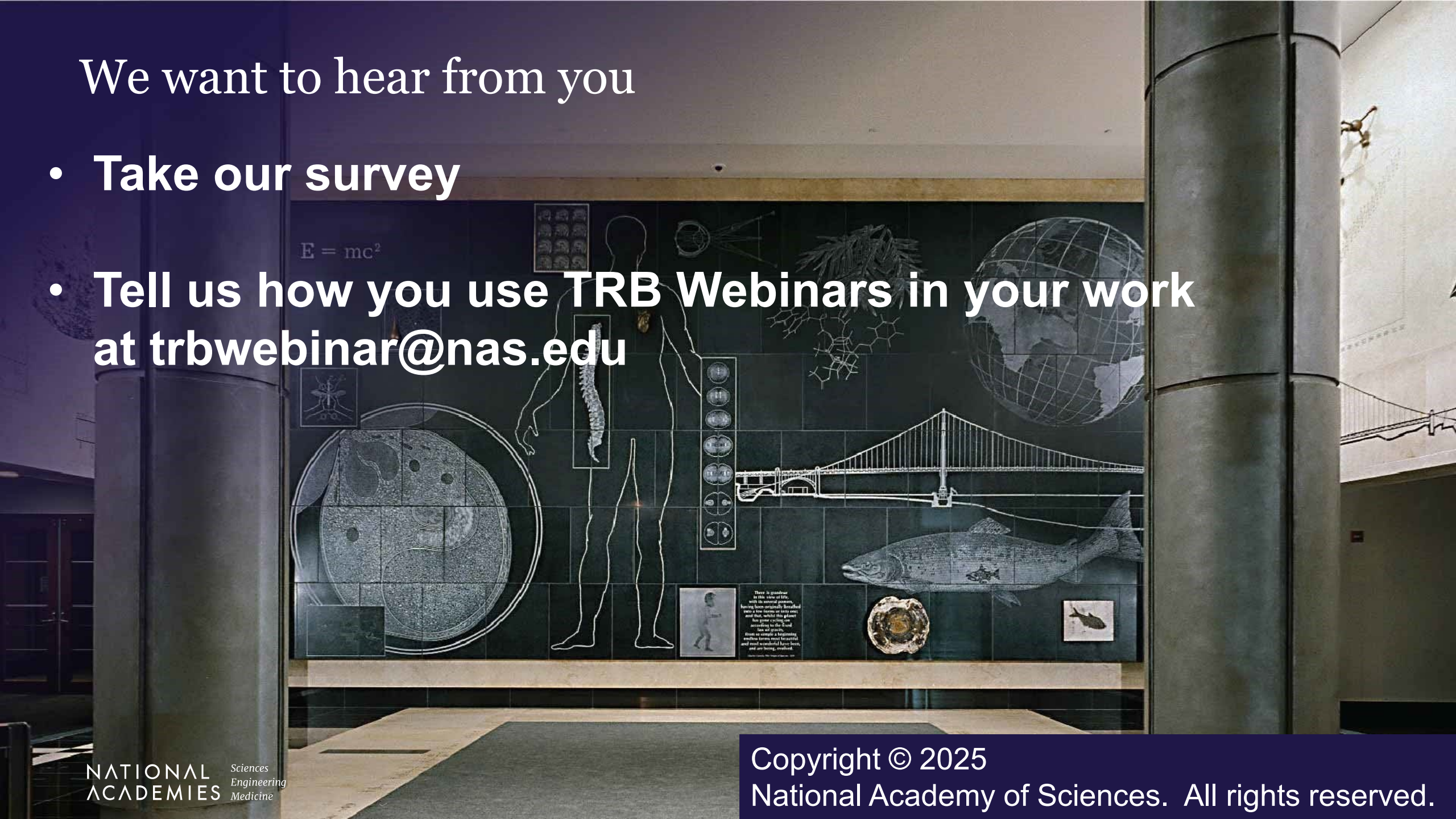

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