



*Eunice Kennedy Shriver* National Institute  
of Child Health and Human Development

# **Teenage Drivers: Secondary task engagement, Visual Inattention and Crash Risk**

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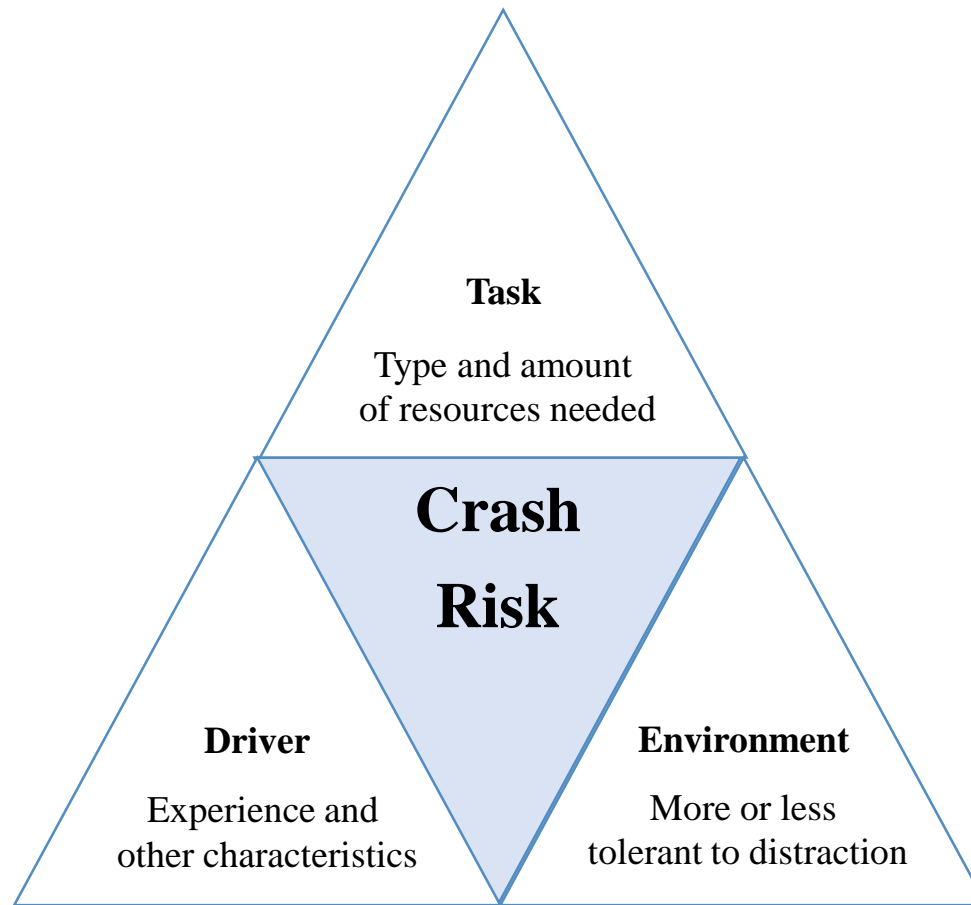
7th International Symposium on Naturalistic Driving Research

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## **For teens:**

- 9% of the teens fatal crashes attributed to distracted driving
- 76% of teens rear-end crashes involved engagement in secondary task

# Distraction and Crash Risk



## Visual inattention:

- Visually demanding tasks are associated with increased crash and near-crash risks
- When engaging in complex tasks novice teens have longer eyes-off-road compare to experienced drivers

# Research Goal

**Determine the extent visual inattention during secondary task engagement contributes to teens crash risk**

Research questions:

1

What is the prevalence of secondary tasks engagement among teen drivers?

2

Which secondary tasks are associated with increased crash risk?

3

What is the role of eyes-off-road in the association between high-risk secondary tasks and crash risk?

# Supervised Practice Driving Study Data

**Crashes:** (n=71) any physical contact between the driver's vehicle and other object

**Baselines:** (n=1,196) random sampled trip segments that representing "normal" driving

## Secondary tasks:

- Identified and coded in both crashes and baselines datasets
- 41 types of secondary tasks mapped into 9 categories
- Total duration of eyes-off-road (TEOR): the sum of time the driver's gaze was not on the forward road

# Research Questions

1

What is the prevalence of secondary tasks engagement among teen drivers?

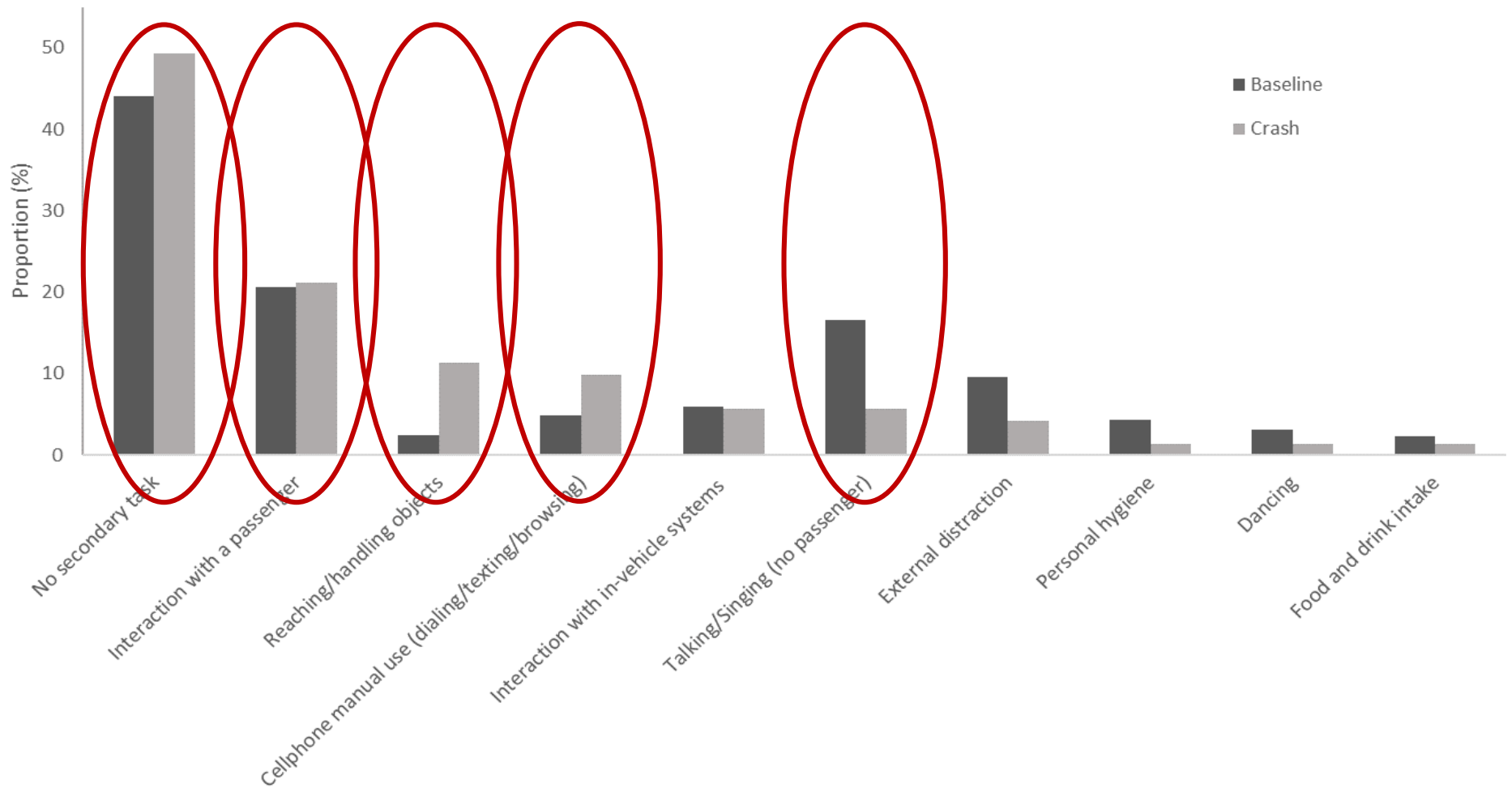
2

Which secondary tasks are associated with increased crash risk?

3

What is the role of eyes-off-road in the association between high-risk secondary tasks and crash risk?

# Prevalence of secondary tasks engagement among teen drivers



# Research Questions

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# Research Questions

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What is the prevalence of secondary tasks engagement among teen drivers?

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# The effect of visual inattention

**Secondary task**

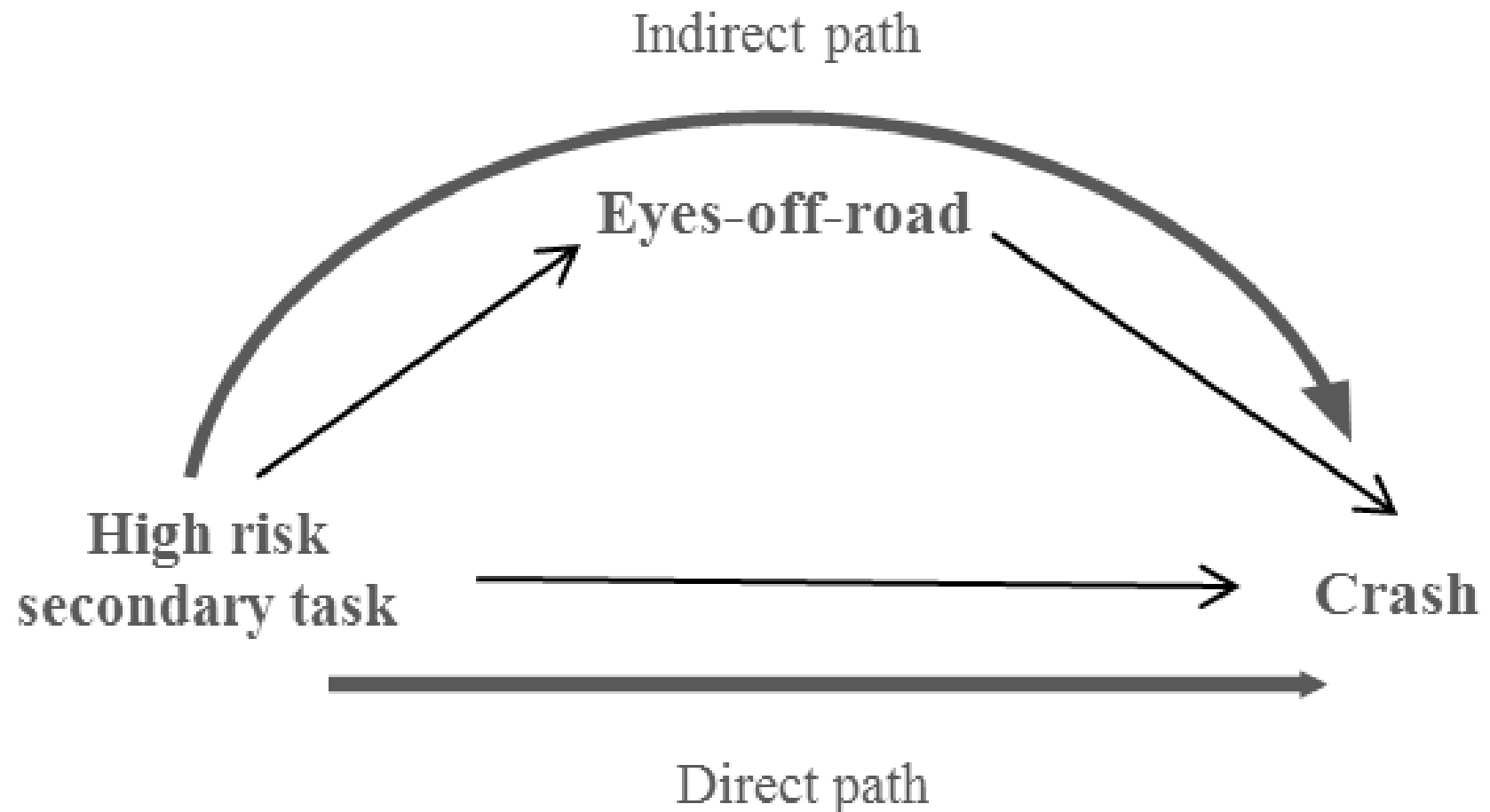


**Crash**

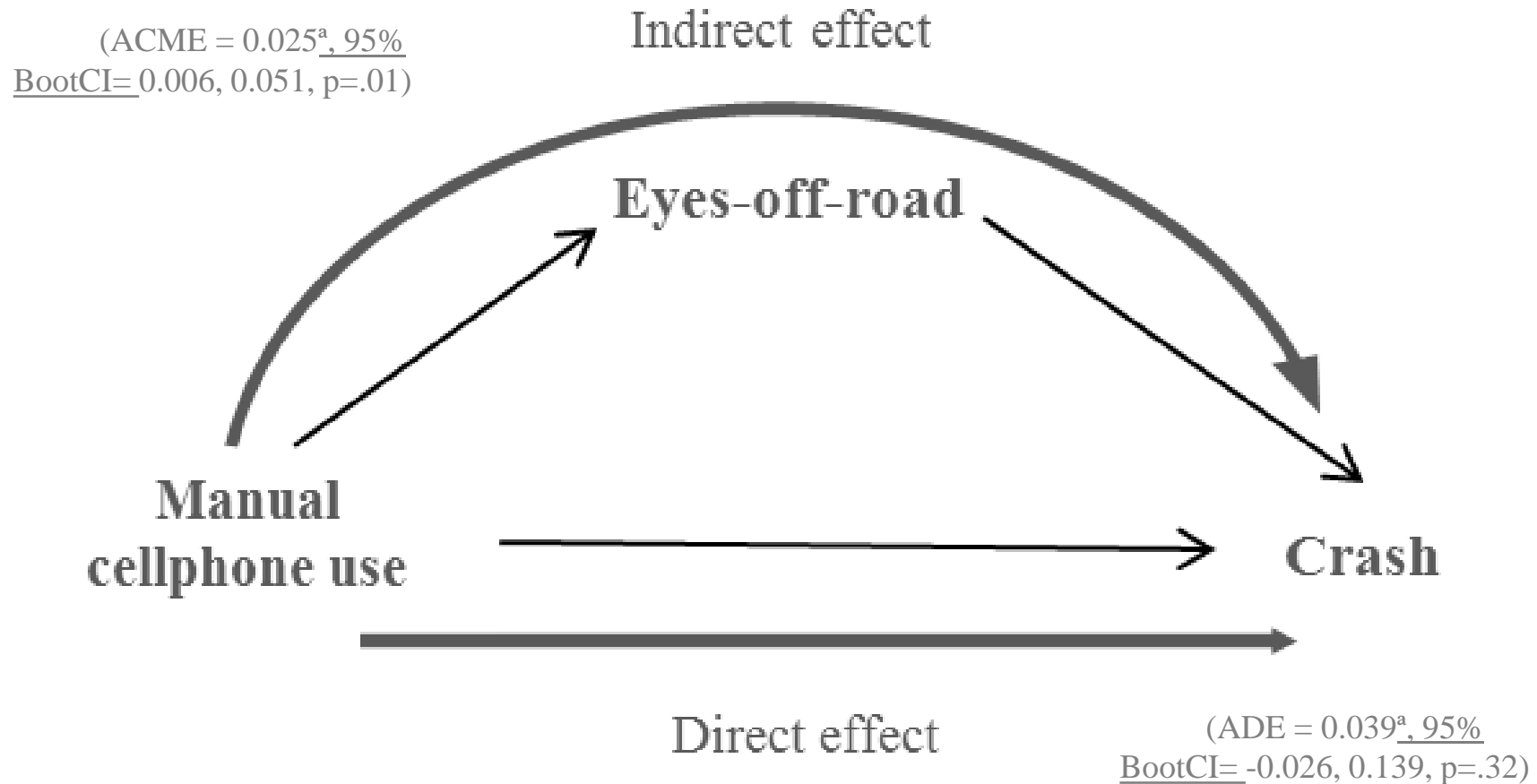
Manual cellphone use 2.67 (1.1, 4.8)

Reaching 6.88 (2.6, 18.6)

# The effect of visual inattention



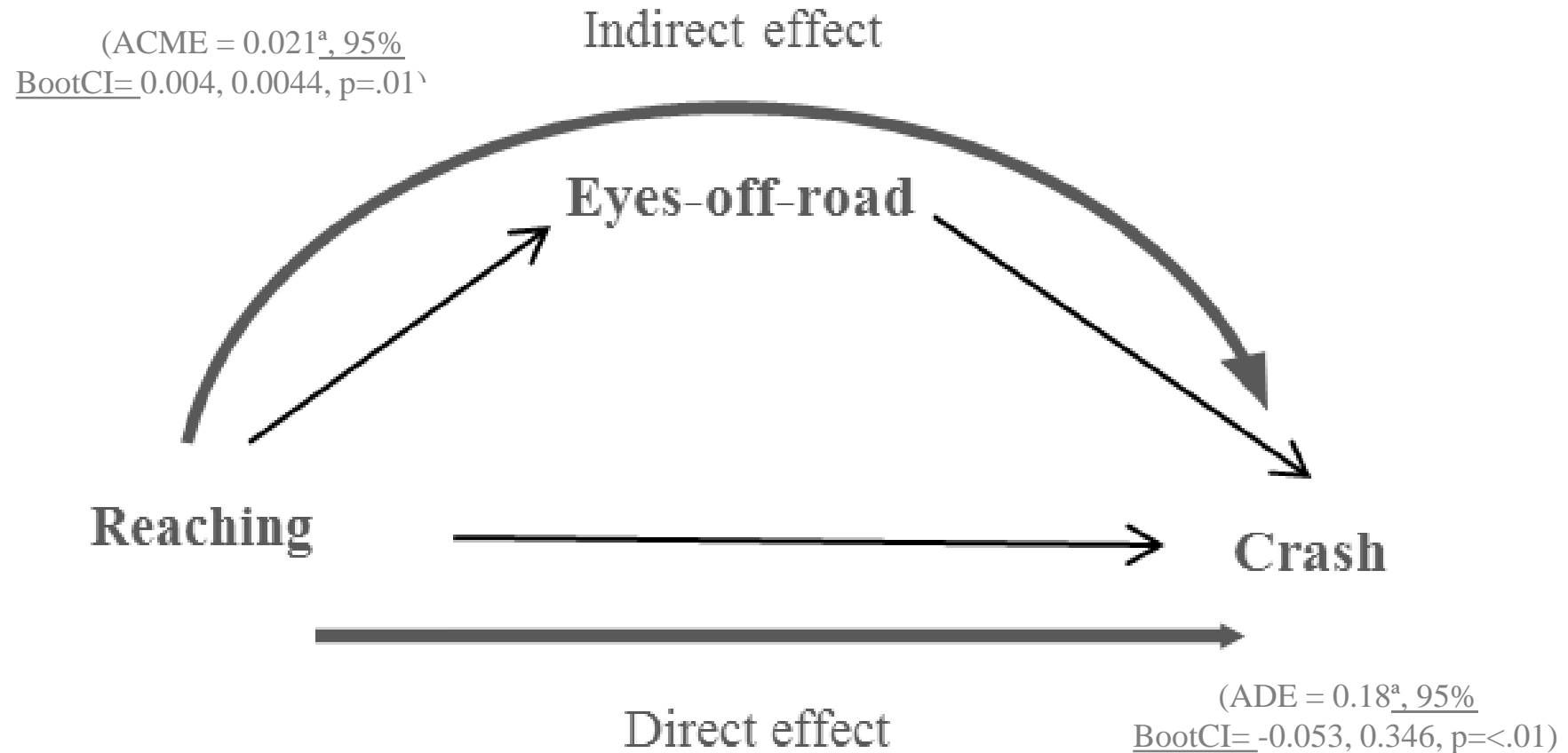
# Manual Cellphone Use, Visual Inattention and Crash Risk



Proportion mediated 40%

The model uses logit link function as such the estimate is on a logarithmic scale

# Reaching, Visual Inattention, and Crash Risk



proportion mediated 11%

The model uses logit link function as such the estimate is on a logarithmic scale

# Discussion and Conclusions

- Secondary task engagement was highly prevalent among novice teen drivers
  - Prevalence is not indicative of increase in crash risk
- Understanding the mechanism of influence and quantifying the effect is essential in adopting effective interventions to decrease distraction.

# Take Home Message

- Identify which tasks increase crash risk and **WHY**
  - Educate young drivers
  - Adapt effective legislation
  - Develop appropriate safeguards to counteract inattention

# Thank You!

## Collaborators

- Bruce Simons-Morton, NICHD/DIPHR/HBB
- Kellienne Sita
- Johnathon P. Ehsani, Johns Hopkins Bloomberg School of Public Health
- Chunming Zhu, NICHD/DIPHR
- Sheila G. Klauer, Virginia Tech Transportation Institute
- Tom Dingus, Virginia Tech Transportation Institute

Thank you for staying engaged!

Questions?