

Lisa Durrance Blalock<sup>1</sup>, Benjamin D. Sawyer<sup>1</sup>, Ariana Kiken<sup>2</sup>, & Benjamin A. Clegg<sup>1</sup>

<sup>1</sup>Psychology Department, Colorado State University, Fort Collins, CO

<sup>2</sup>Psychology Department, California State University - Long Beach, Long Beach, CA

## Introduction

### Driving & Load

- Driving under load conditions (e.g., cell-phone use) significantly impairs driving ability (e.g., Caird et al., 2008; Strayer & Drews, 2007)
- What are the cognitive mechanisms underlying impairment?
  - Inaccurate mental models due to poor attention allocation while driving (Strayer & Drews, 2007)

### Situation Awareness (SA) & Driving

- SA is the process involved with monitoring our surroundings in dynamic environments (e.g., Endsley, 1995; Endsley, Bolté, & Jones, 2003)
- Currently little research on SA while driving compared to other domains (see Gugerty, 1997; Gugerty & Tirre, 2000; Walker et al., 2009 for exceptions)

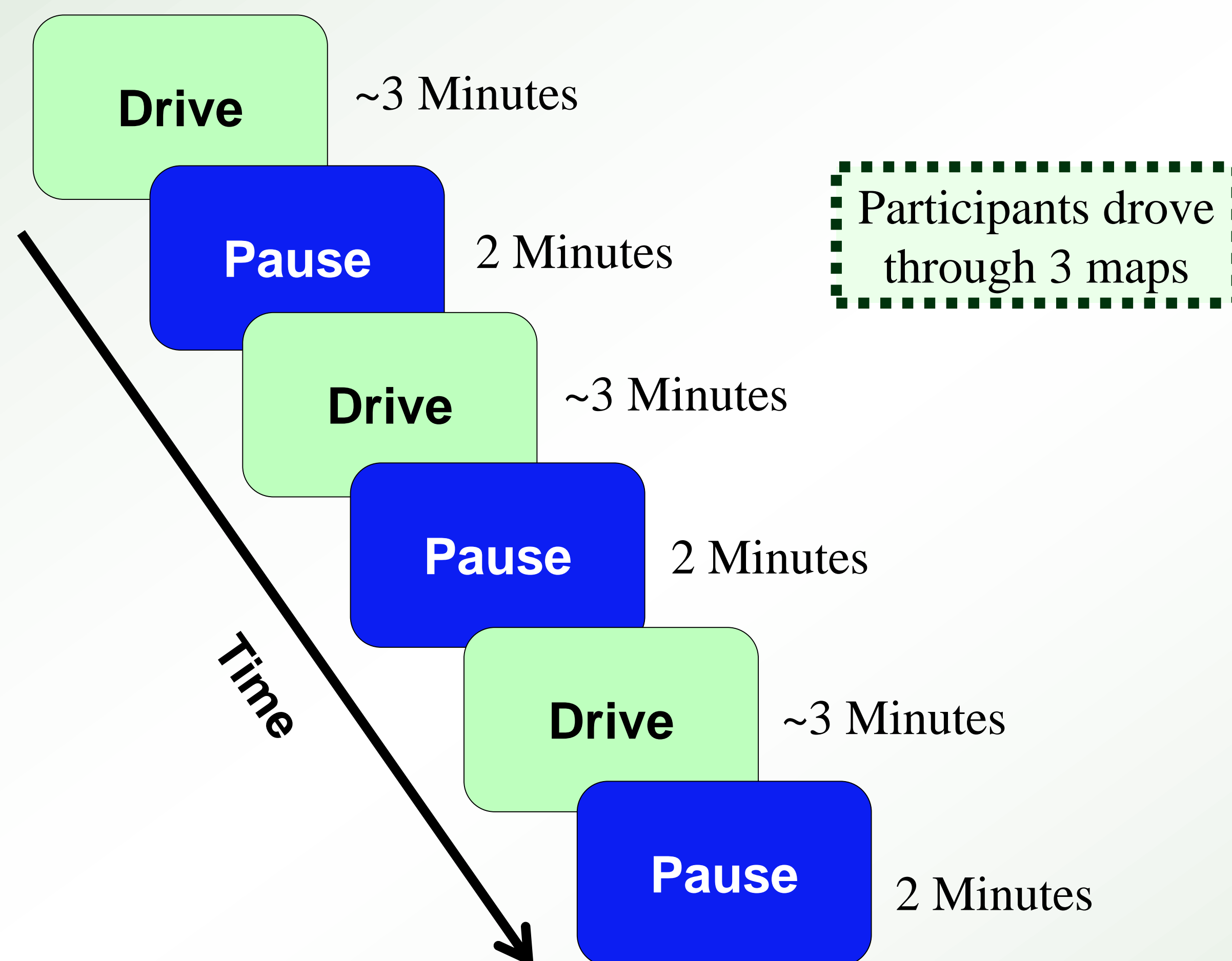
### Current Experiment

- Can impoverished SA while driving under load conditions partially explain this load deficit?

## Method

- 28 undergraduate students with valid driver's license
- Mixed 2 (Load Condition) x 2 (Question Type) design
  - Load condition: Load vs. No Load (within-subjects)
  - Question Type: Dynamic vs. Static (between-subjects)

### Map Procedure



## Load & Driving

### Load vs. No Load Driving



### Load Condition

"539, 532, 525, 518..."

### No Load Condition

No Counting

Time

Participants drove until pause

### Pause with Questions

"What was the last turn you made?"

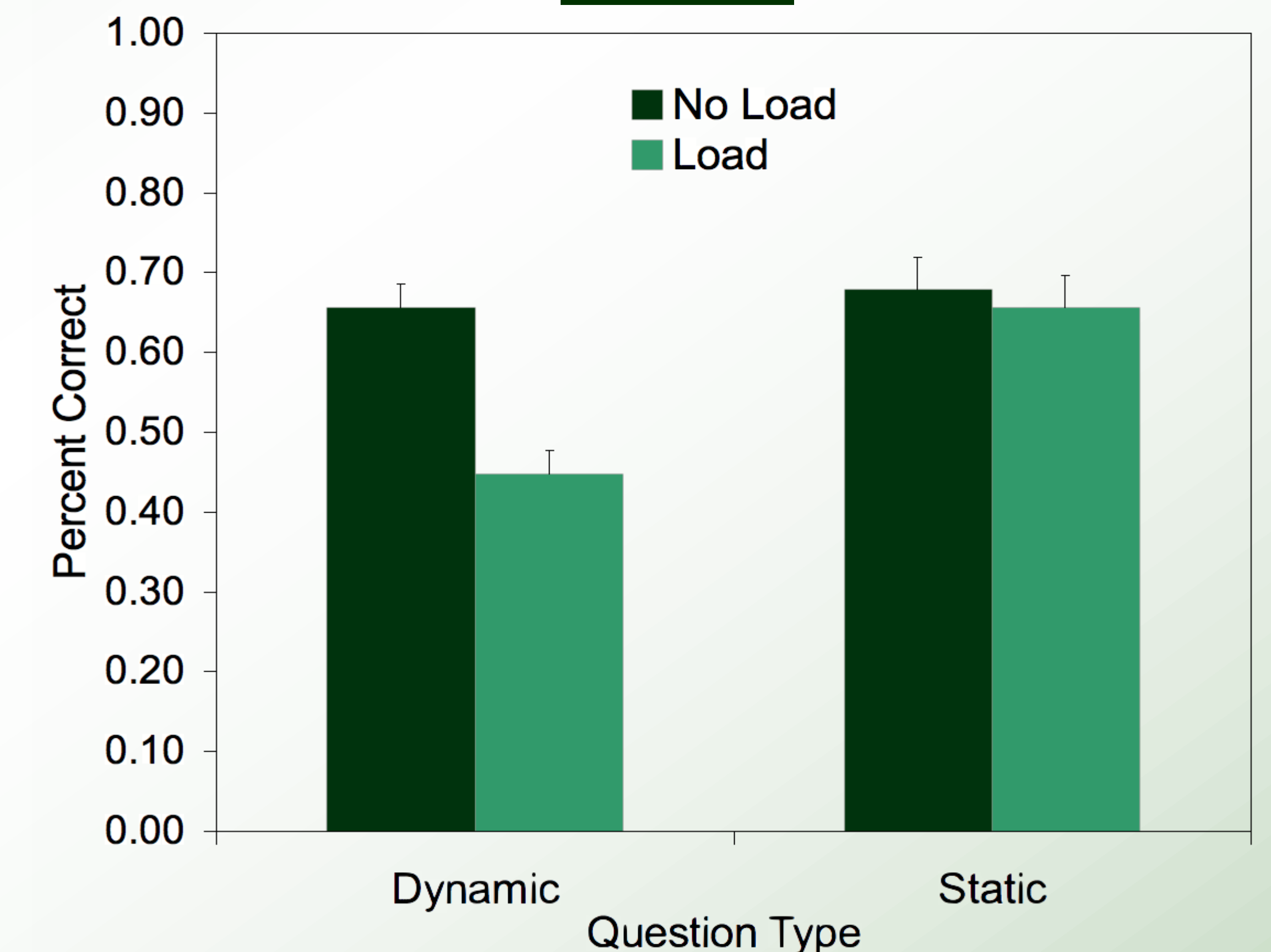
"What was the first building you passed on the right?"

"Is there a car behind you?"

### Example SA Questions & Responses

| Dynamic Questions                            | Answers    | Static Questions                               | Answers       |
|--|------------|--|---------------|
| What vehicle is currently passing you?       | School Bus | What was the most recent road sign you passed? | Deer Crossing |
| Which direction did the dump truck turn?     | Left       | On which side of the road was the gas station? | Left          |
| How many motorcycles have you passed so far? | 2          | What is the current posted speed limit?        | 35            |

## Results



### Load x Question Type Interaction

- Decreased memory for dynamic items when driving under a load, but not for static items
- Effects not due to greater difficulty for dynamic questions

## Discussion

- Current results show degraded SA while driving under an attentionally demanding load.
  - Results also suggest making distinctions between different types of situational knowledge

### Implications for Current SA Theories

- Current experiment supports link between dynamic knowledge and SA
- May offer discriminant validity between basic memory phenomena and SA

### Implications for Cell-phone & Driving Research

- Consistent with Strayer & Drews' (2007) attentional bottleneck view of distracted driving

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 Corresponding e-mail: Lisa.Blalock@colostate.edu  
<http://lamar.colostate.edu/~ldurranc>

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