

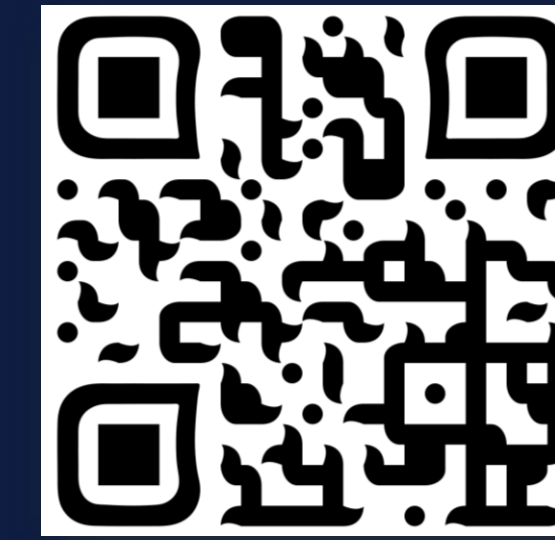
# Eye Movements in Repeated Reading

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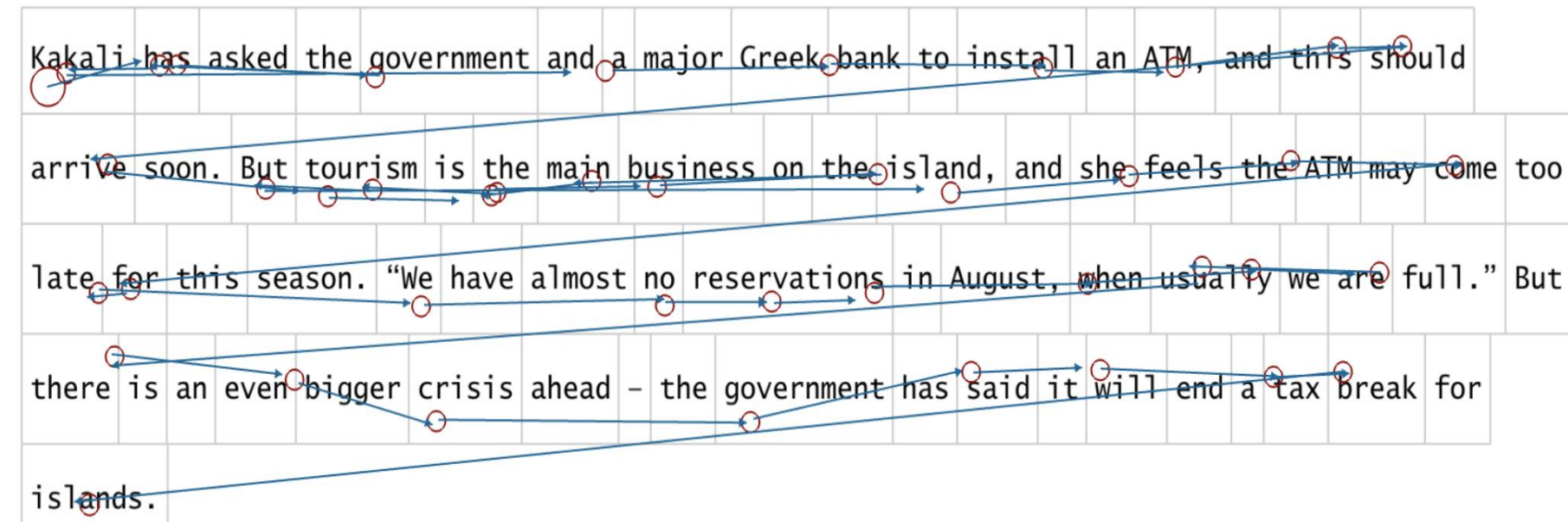
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## Introduction

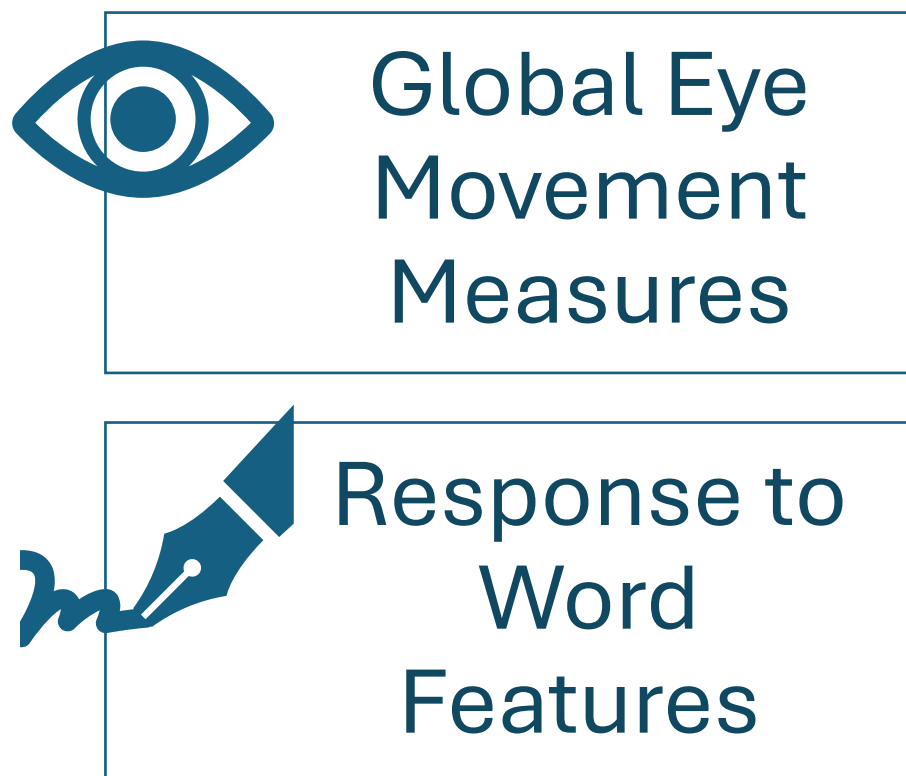
### Eye-Tracking During Reading Comprehension



Q: What will result from an increase in human population in the future?

- a) More pressure on farming resources
- b) One billion people will not have enough food
- c) The level of greenhouse gases will increase by 35%
- d) Food quality will decrease

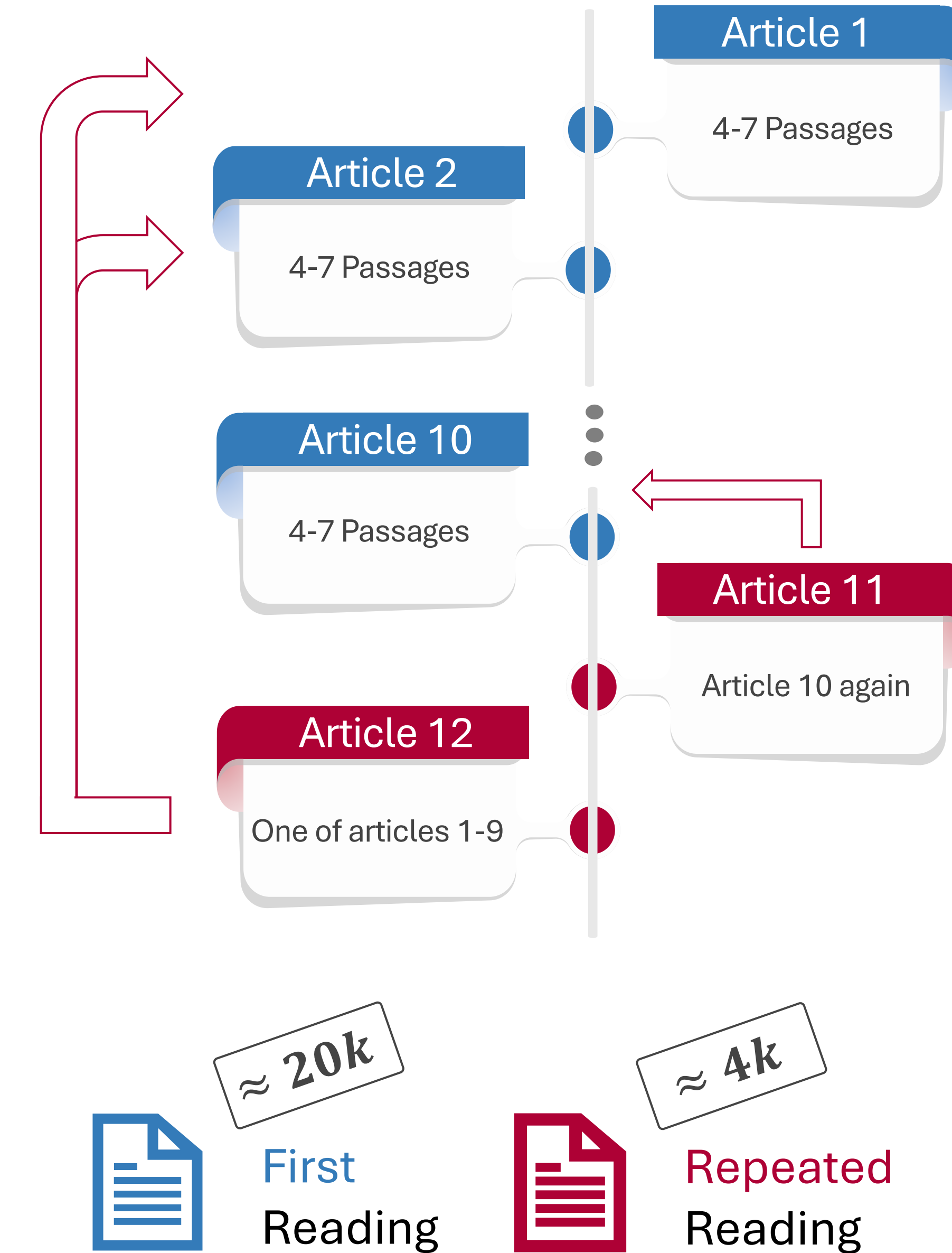
### Objective: empirically characterize Repeated Reading



Conditioned on

- Reader's Goals
- Task Similarity
- Intervening Material
- Individual Differences

## Experiment Structure

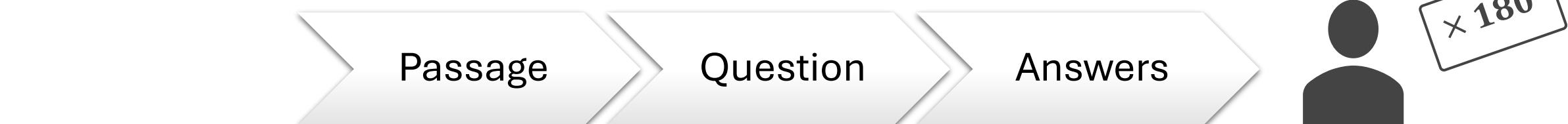


## OneStop Eye-Movement Dataset

### Hunting (information-seeking)



### Gathering (ordinary reading)



\*Each passage presented in Advanced / Elementary with one of three questions

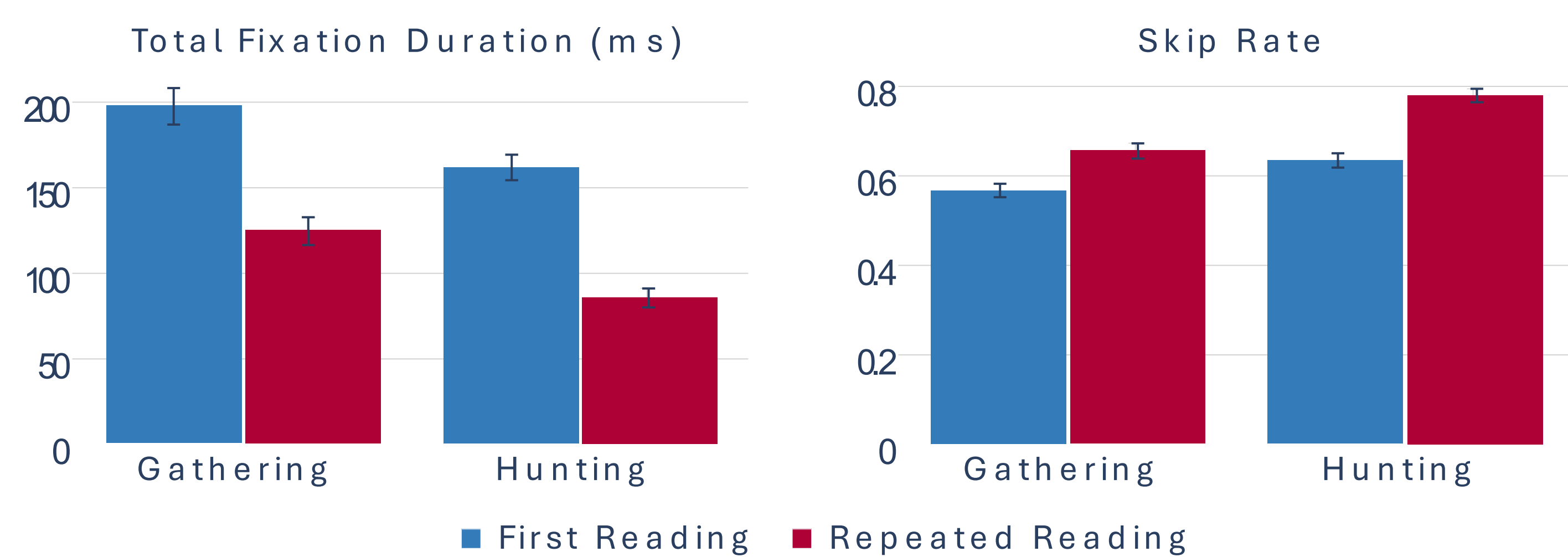
In the next 30 years, the planet's human population will increase to nine billion. **Already one billion people do not get enough food. The increase will put more pressure on agricultural land, water, forests, fisheries and resources, and also food and energy supplies.** The cost of meat is increasing – it costs more money now, but also people have to do more work in the rainforest to make fields or to grow food for cows. Cows **Critical Span** thane.

Q: What will result from an increase in human population in the future?

- a) More pressure on farming resources. (not verbatim!)
- b) One billion people will not have enough food
- c) The level of greenhouse gases will increase by 35%
- d) Food quality will decrease

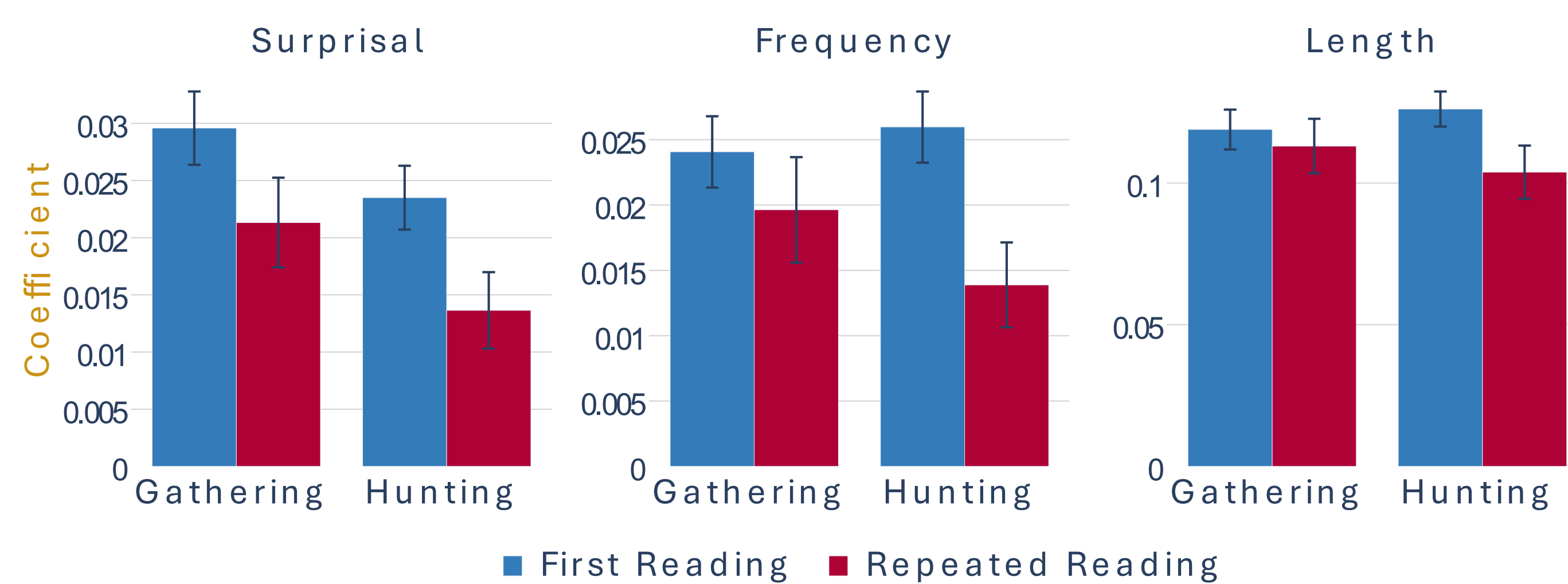
## Reader's Goals

### Global Eye Tracking Measures:



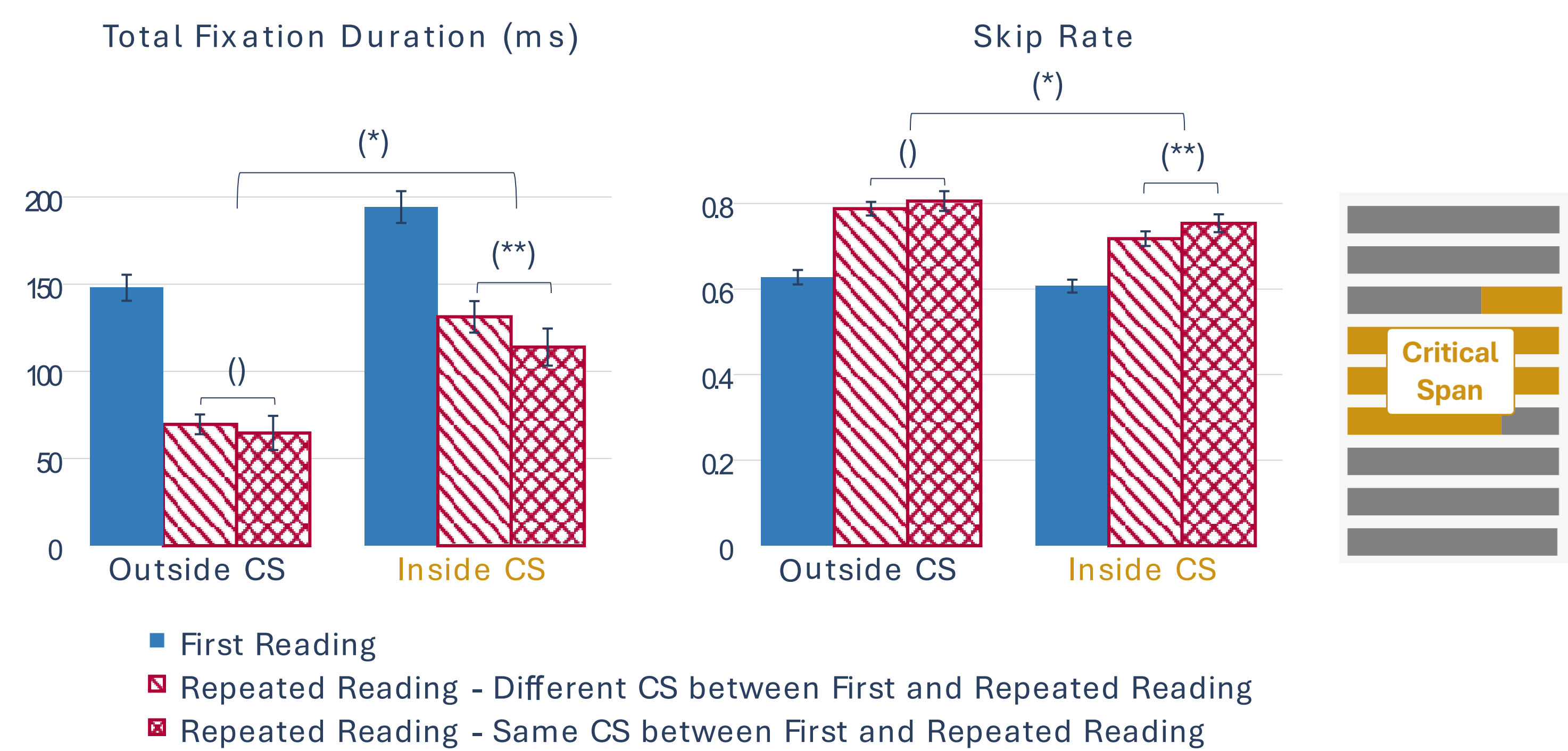
### Response to Linguistic Properties:

$$TFD = \theta_{freq} \cdot Frequency + \theta_{surp} \cdot Surprisal + \theta_{len} \cdot Length + RE^*$$

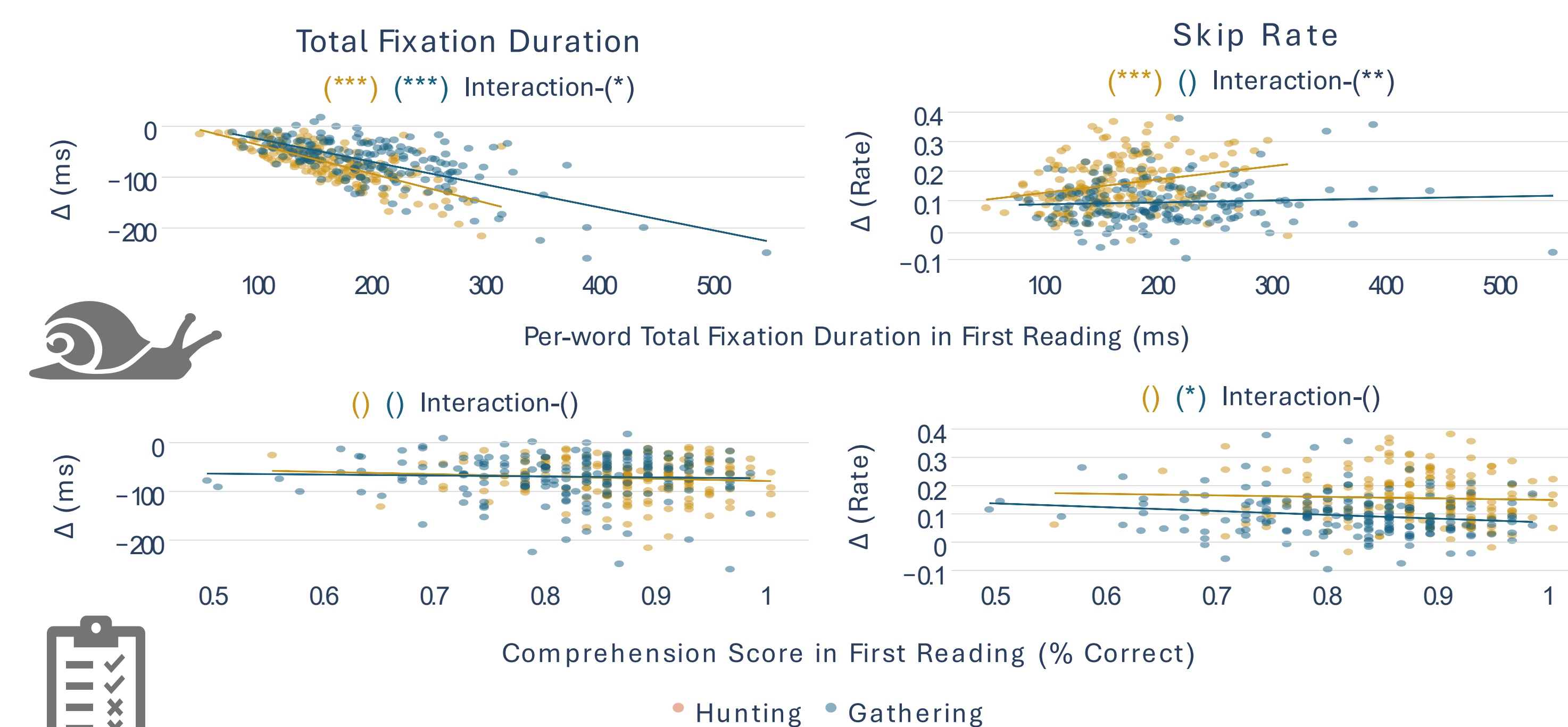


\* RE = random effect terms w.r.t participants and paragraphs

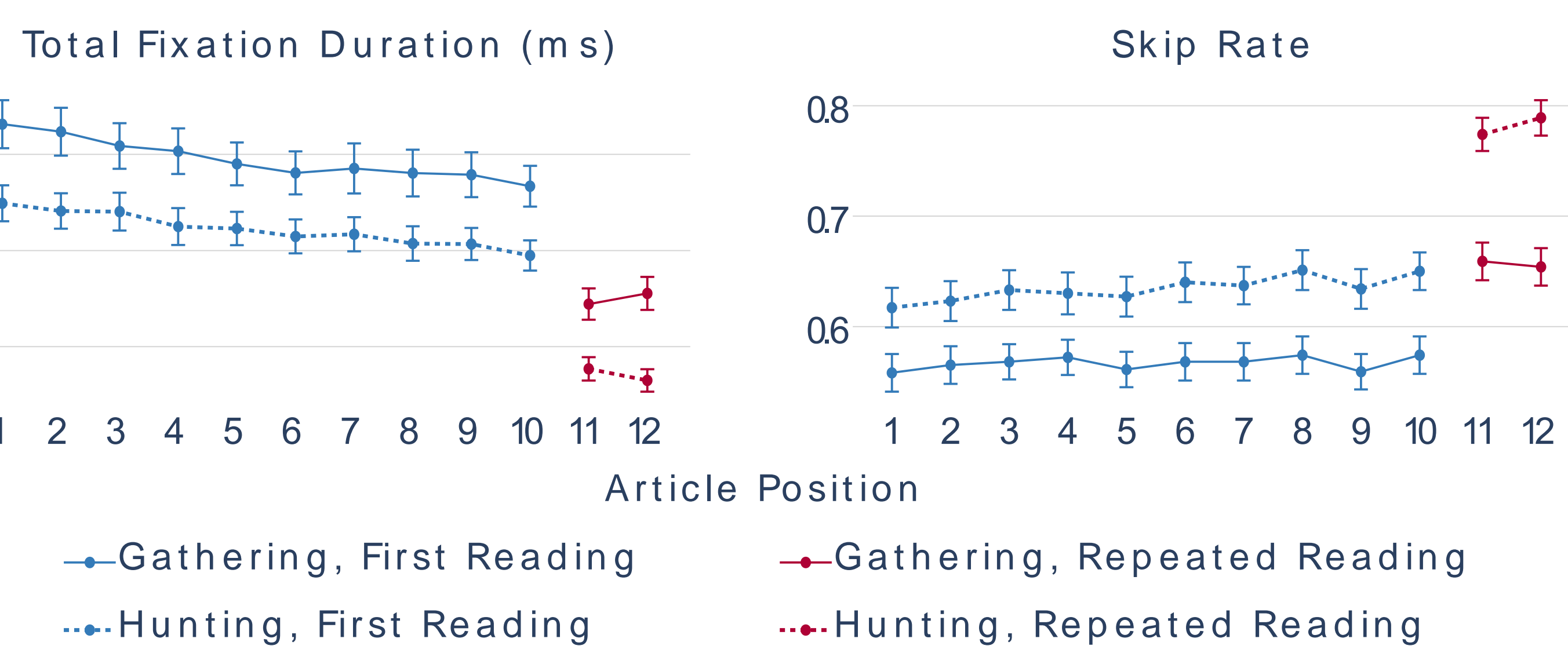
## Task Similarity – Hunting Only



## Individual Differences



## Intervening Material



## Conclusions

- We find large and robust facilitation in repeated reading, reflected in both global eye movement measures and response to word properties.
- Our analyses show that these facilitation effects can be modulated by when and how the first text was read.
- Our results can inform future models of eye movements in reading that will account for repeated reading.