

# Action Enhances Memory of Descriptions but Not Memory or Segmentation of Movies

## Background

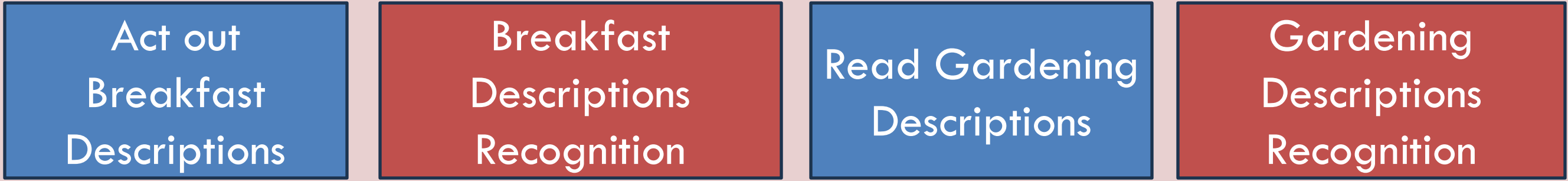
- Embodied cognition theory: Shared neural mechanisms for acting, perceiving, and remembering actions<sup>1</sup>.
- Enactment effect: Performing actions enhances memory for their descriptions<sup>2</sup>.
- In perception, previous studies have shown a positive correlation between action performance and perceiving structures in everyday activities, as measured by event segmentation task<sup>3</sup>.
- Yet, embodied cognition suggests detailed action simulation might negate physical performance effects on memory and perception.
- We conducted four studies testing embodied cognition's claims about action's influence on perception and memory of everyday activities.

## Hypotheses

- Extending the enactment effect to everyday activities, action performance will enhance both memory and structural perception.**
- Action Simulation Account: Visual-spatial cues may activate motor representations regardless of actual performance, negating prior action effects.**

## Enactment Effect for Action Embedded in Daily Activities

- Stimuli:**
- 225 Action descriptions from two movies (breakfast and gardening)
- Participants:**
- N=33, Female=15, Male= 18, Mean Age:36.07, SD:11.74
- Task:**
- Participants read and enacted action sequences as shown in movies, then completed a recognition test (selecting one correct action description from three options)
  - The order of the movies and tasks was counterbalanced across participants



Controlling for the random effects of participants and movie type, the probability of recognizing the action descriptions was significantly higher after acting out these actions compared to reading them ( $p=0.003$ ).

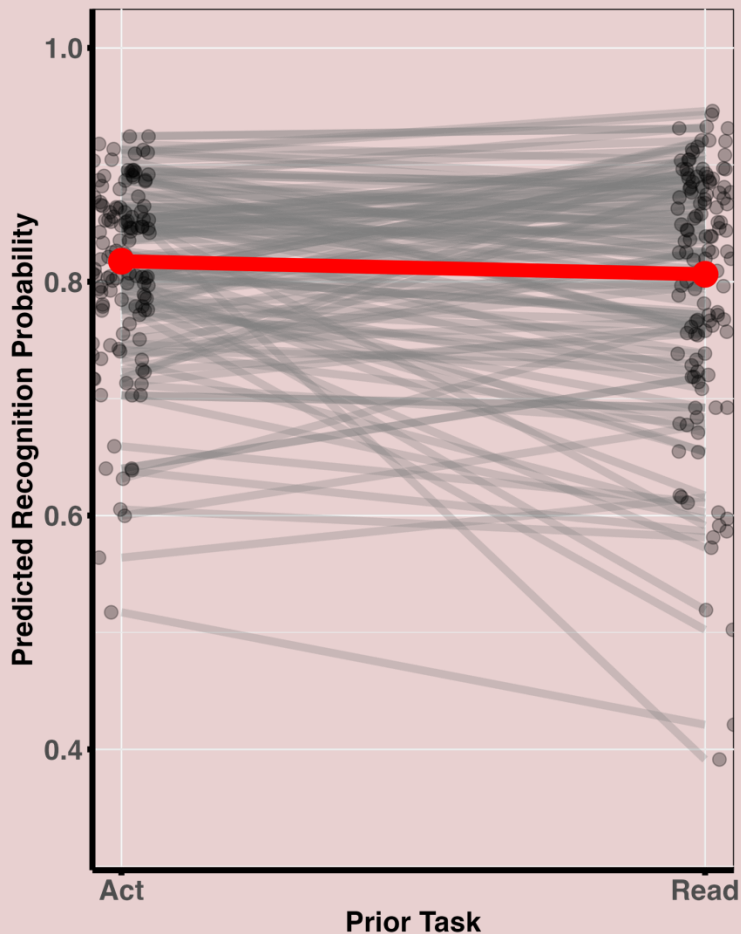


## No Enactment Effect for Recognition Memory of Movies

- Participants:** N=130, Female=74, Male=56, Mean Age:28.16, SD:4.61
- Task:**
- Participants enacted action sequences, watched corresponding movies, then completed a two-option recognition test on movie content. The order of the movies and tasks was counterbalanced across participants.

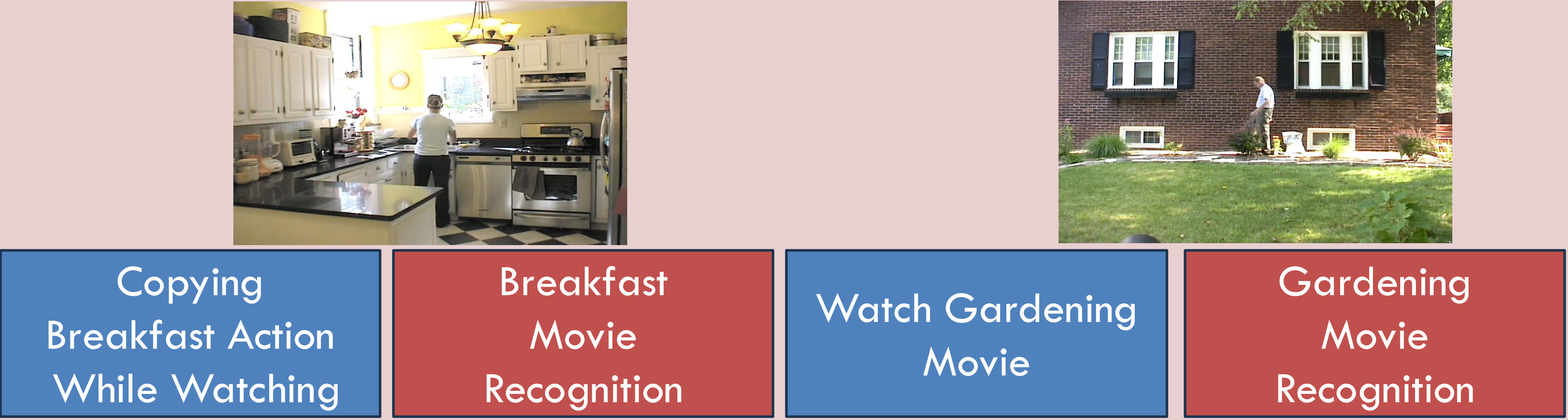


Bayes factor is 0.02, suggesting that there is strong evidence for the null.

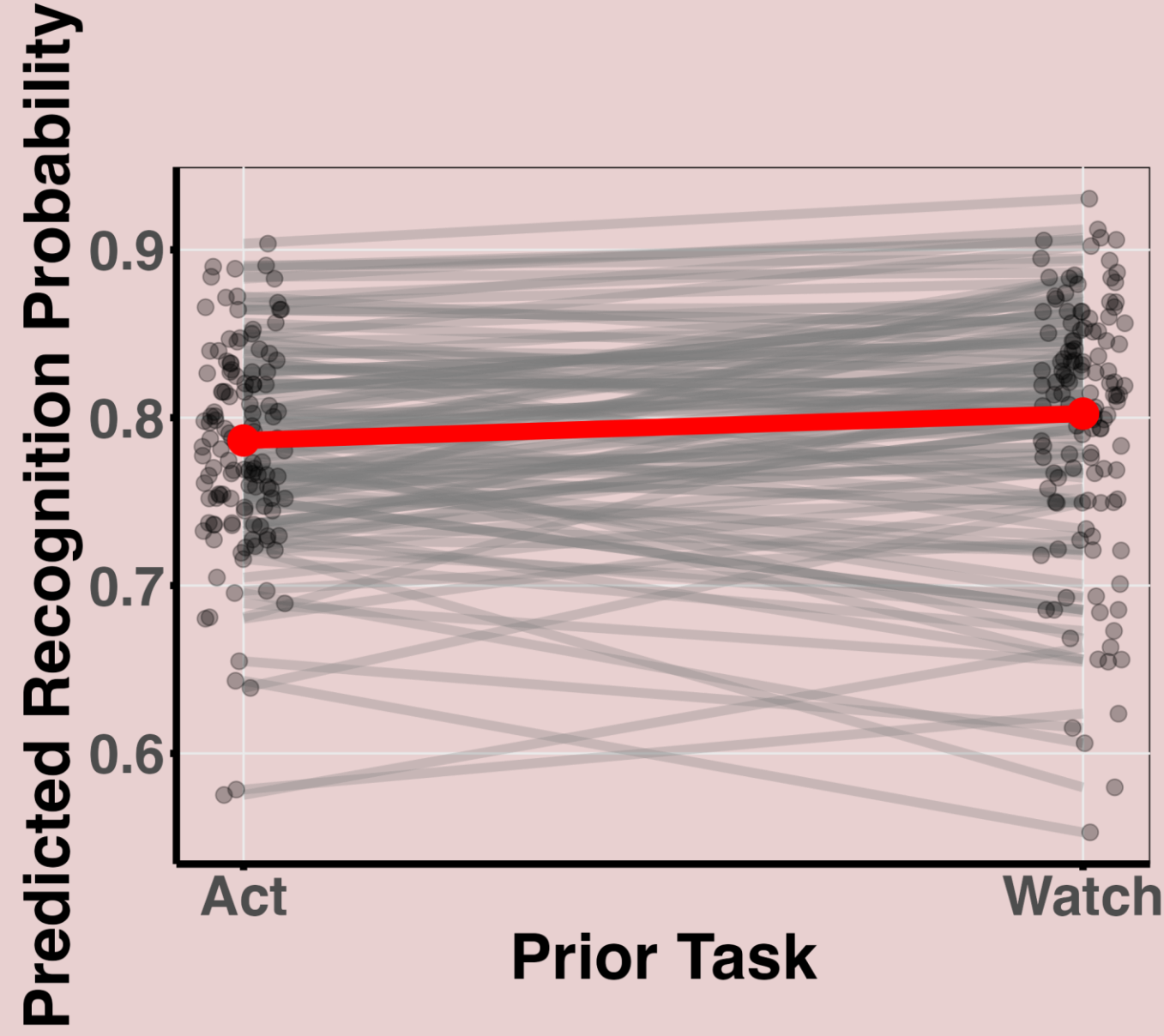


## The Impact of Acting on Episodic Memory of Everyday Activities

- Participants:** N=129, Female= 76, Male=69, Mean Age:28.69, SD:5.55
- Task:**
- For one movie, the participants simply watched, while for the other, they mimicked the actions during viewing. They were subsequently tested on their recognition memory of the movie content.
  - The order of the movies and tasks was counterbalanced across participants.

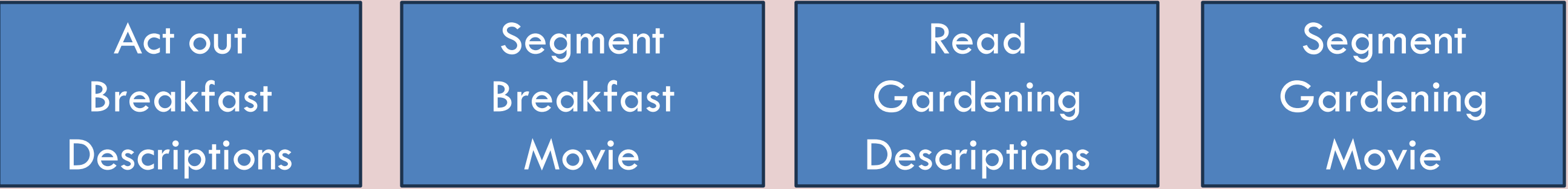


Bayes factor is 0.02, suggesting that there is strong evidence for the null.

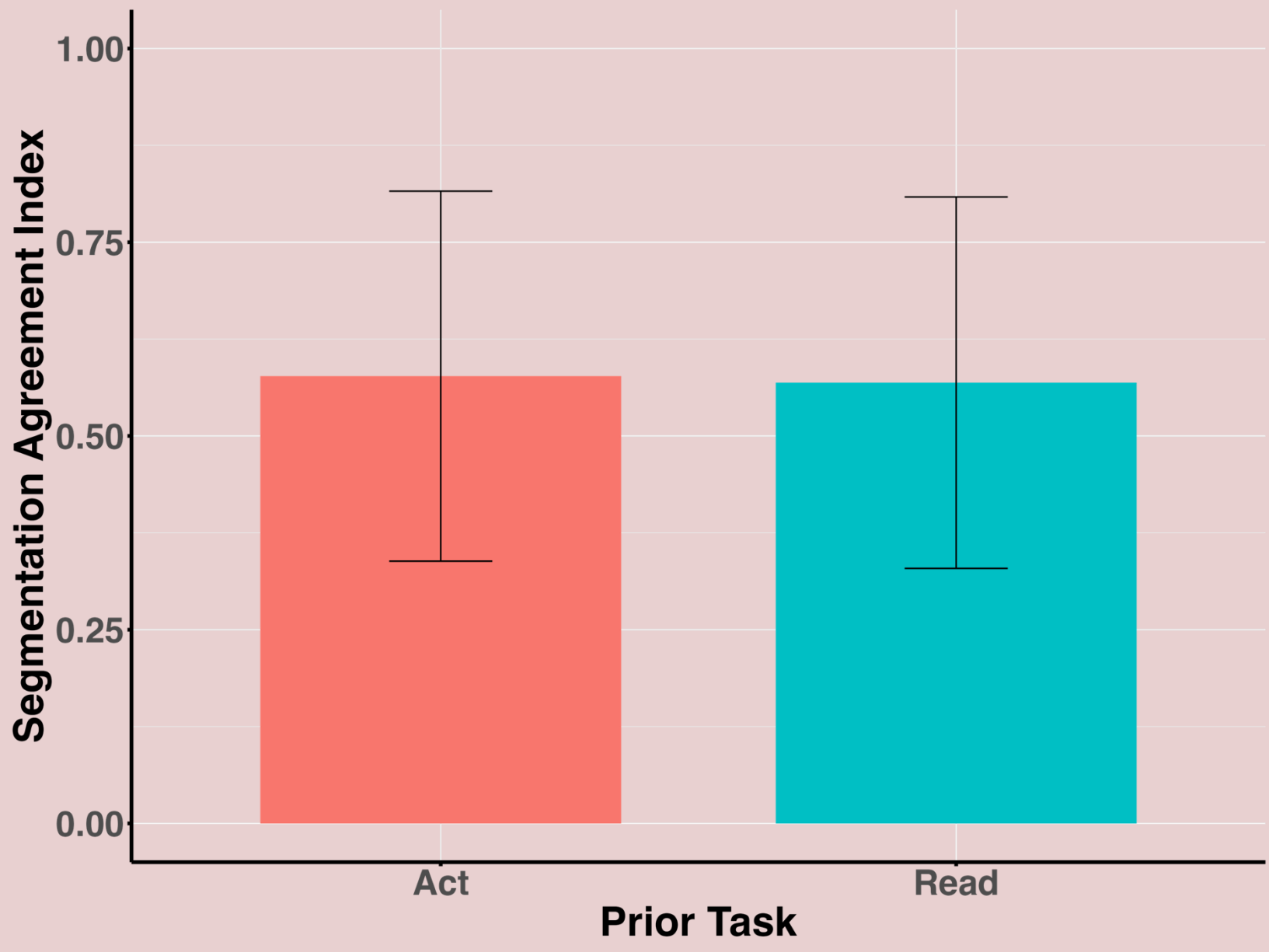


## The Impact of Acting on Event Segmentation of Everyday Activities

- Participants:** N=127, Female=60, Male=50, Mean Age:27.73 SD:5.66
- Task:**
- Participants read and acted out a series of actions in the order shown in the movies. They then performed the segmentation task on the corresponding movies
  - The order of the movies and tasks was counterbalanced across participants.



**Segmentation Agreement Index:** scaled correlation between an individual's segmentation pattern and the group-averaged segmentation pattern



Bayes Factor is 0.21 , suggesting that there is moderate evidence to support the null.



## Conclusions & Key Takeaways

- We replicated the enactment effect for action descriptions embedded in everyday activities. However, this effect did not generalize to the perception or recognition of everyday activities in continuous visual-audio format.**
- Consistent with embodied cognition, people simulate associated motor performance experiences while perceiving everyday activities in continuous visual-audio format.**
- This study calls for caution when extending findings from lab-based studies of various memory techniques to real-life situations, where people have many cues to boost their memories, potentially rendering some explicit lab-developed strategies less effective.**

## References

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