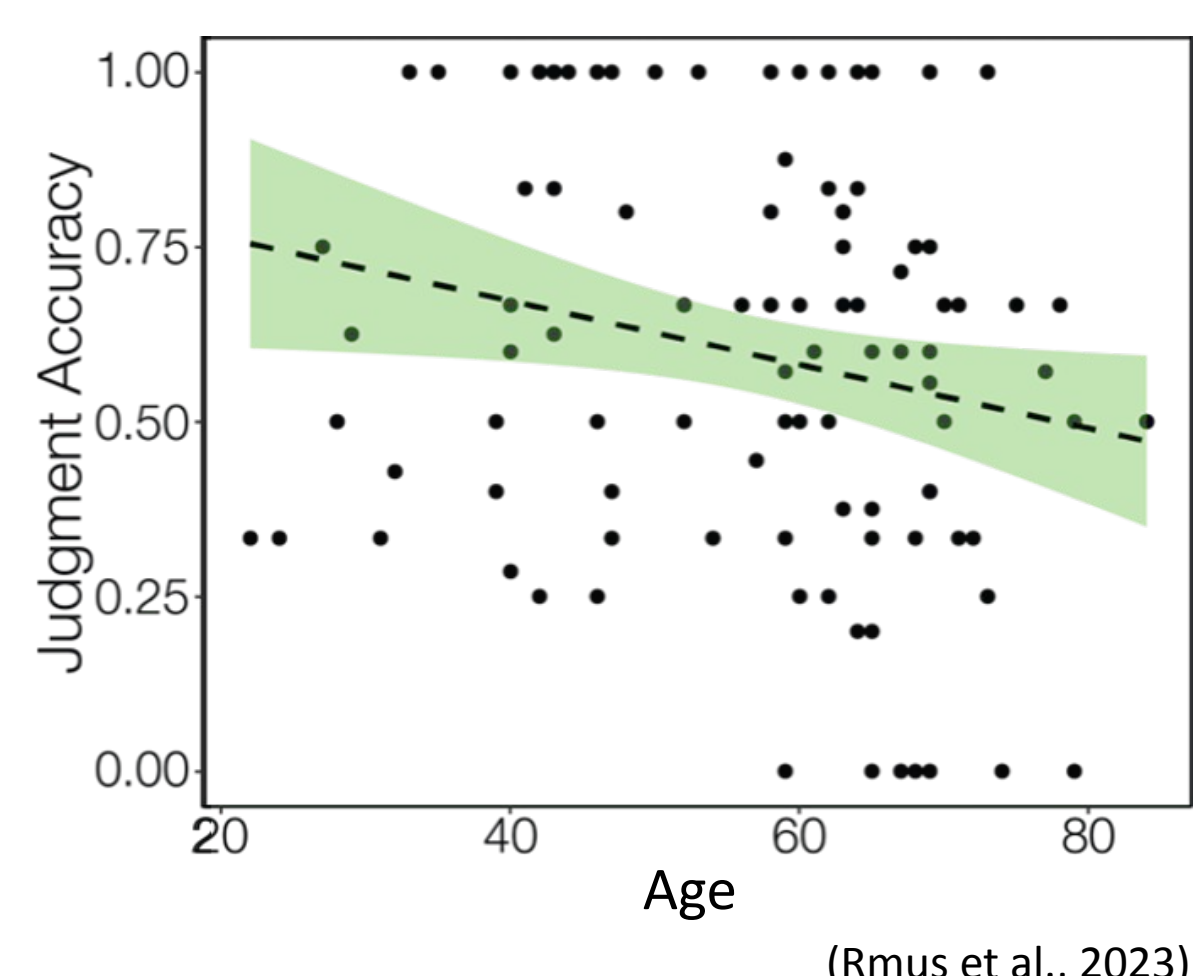
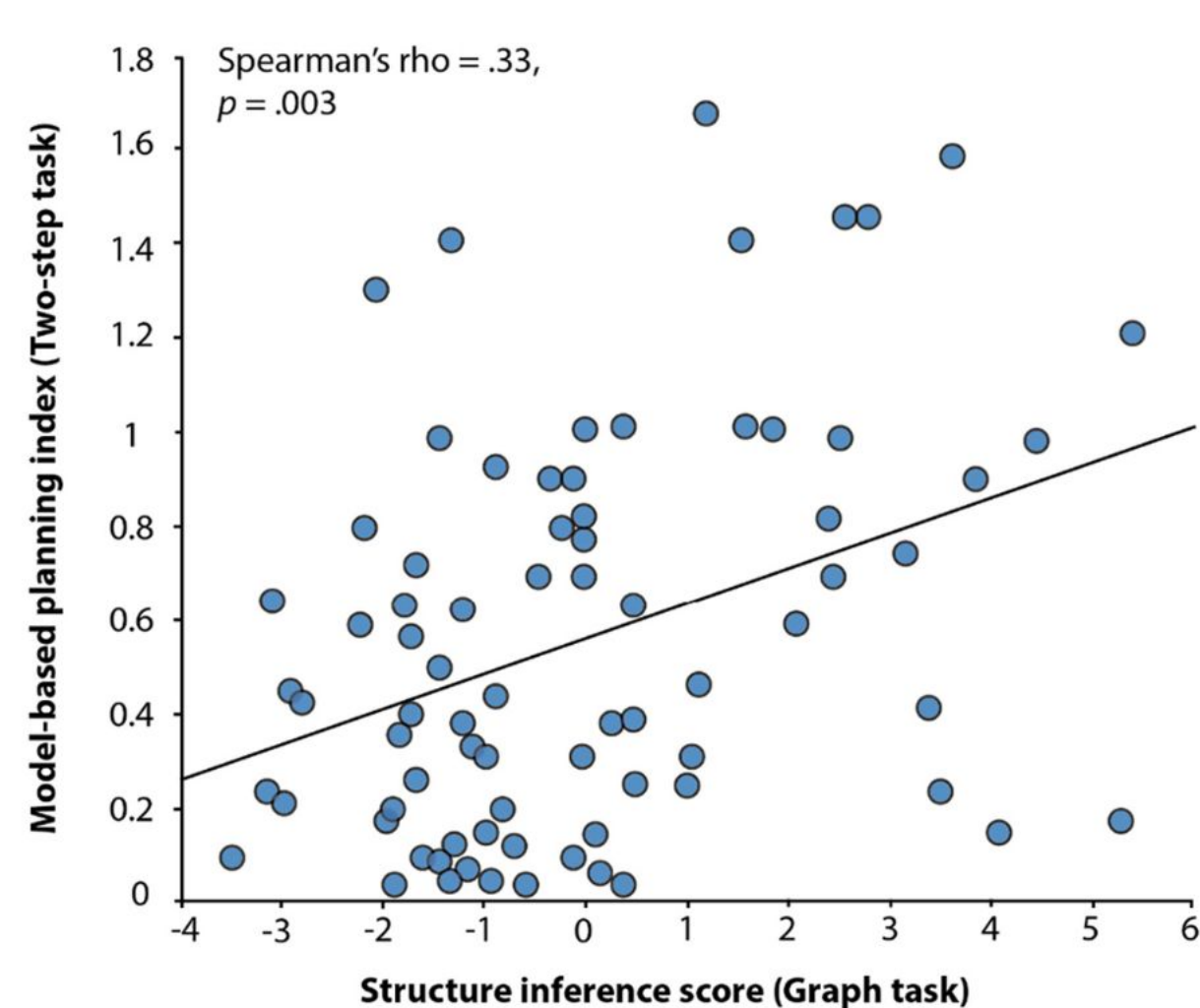


## Background

- Humans are able to infer complex associative networks even when specific associations were not directly learned (Rmus et al., 2023)
- This structure inference declines with aging (Noh et al., 2023) and work is needed to remediate age-related deficits
- Familiarity of stimuli minimizes differences in memory performance between older and younger adults (Castel, 2005)
- Framing of tasks can elicit different responses in older adults depending on their confidence in accurately completing the tasks (Desrichard & Kopetz, 2005)



## Research Questions

- Do older adults rely more on semantic knowledge to support new learning?
- How does task framing impact the ability to create and navigate an associative network across the adult lifespan?

## Methods

### Participants:

Experiment 1 - Semantic Judgements and Memory

- 88 adults including 45 older adults (65+)
- Split into text validation (23 YA, 20 OA) and image validation (20 YA, 25 OA)

Experiment 2 - Graph Inference and Navigation (2 conditions)

- Abstract / Everyday Objects: 16 younger adults (25-40) and 17 older adults (65+)
- Naturalistic Flights Framing: 12 younger adults (25-40) and 13 older adults (65+)

### Stimuli:

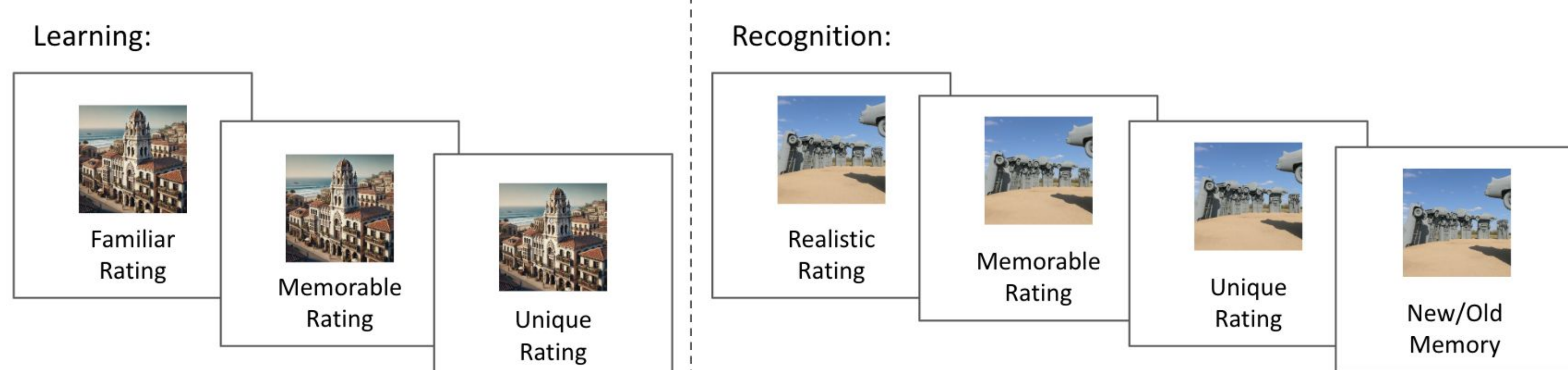
- 200 images were created using OpenAI Image Generation on ChatGPT 4o and filtered in Experiment 1 to use in Experiment 2
- Both conditions in Experiment 2 used 13 images, with randomized presentation

### Analysis:

- Conducted independent sample t-tests and 2x2 ANOVA using SciPy Python 3.11
- \*:  $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$

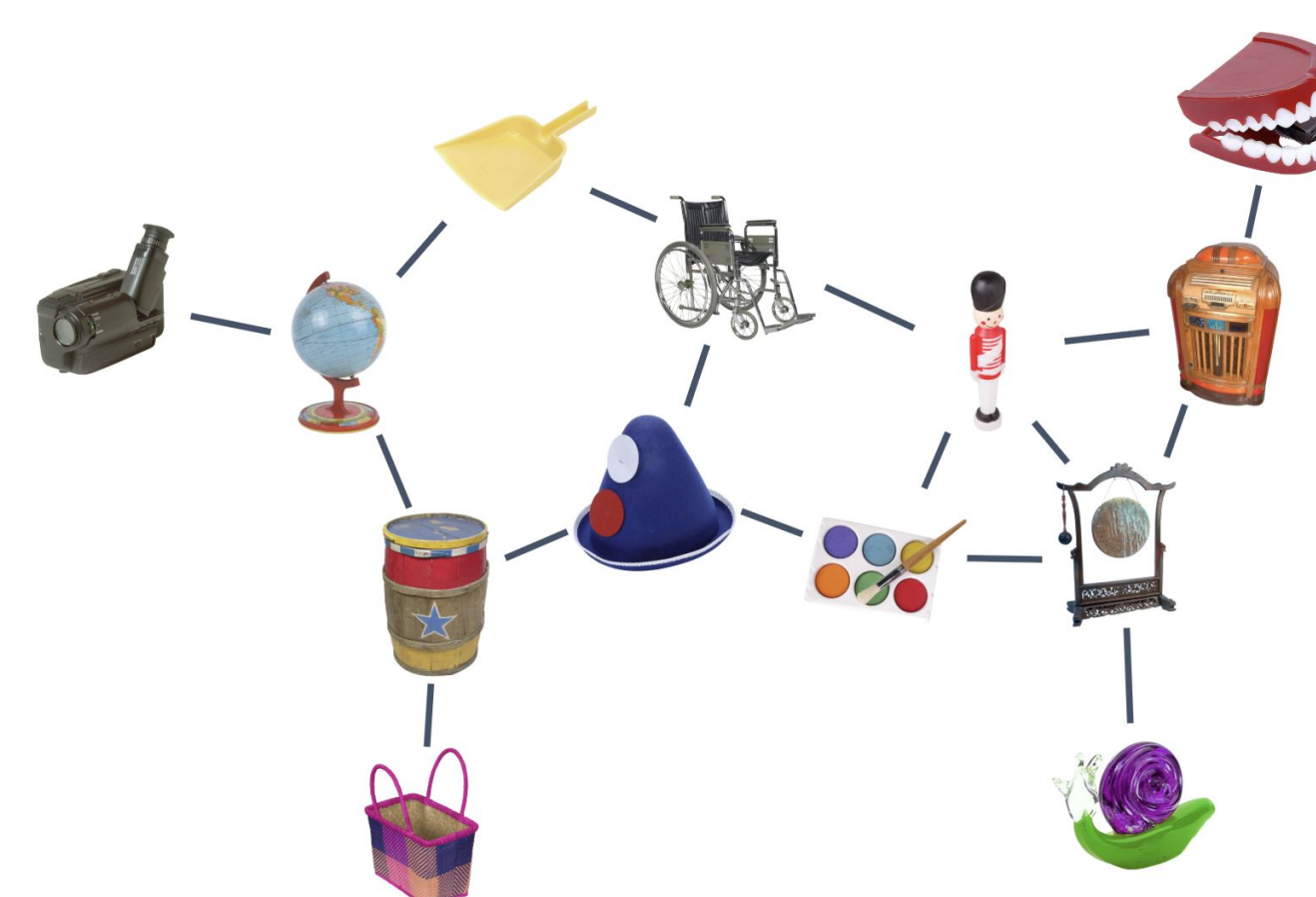
## Experiment 1: Evaluating Semantic City Judgements and Memory

### Task Design:

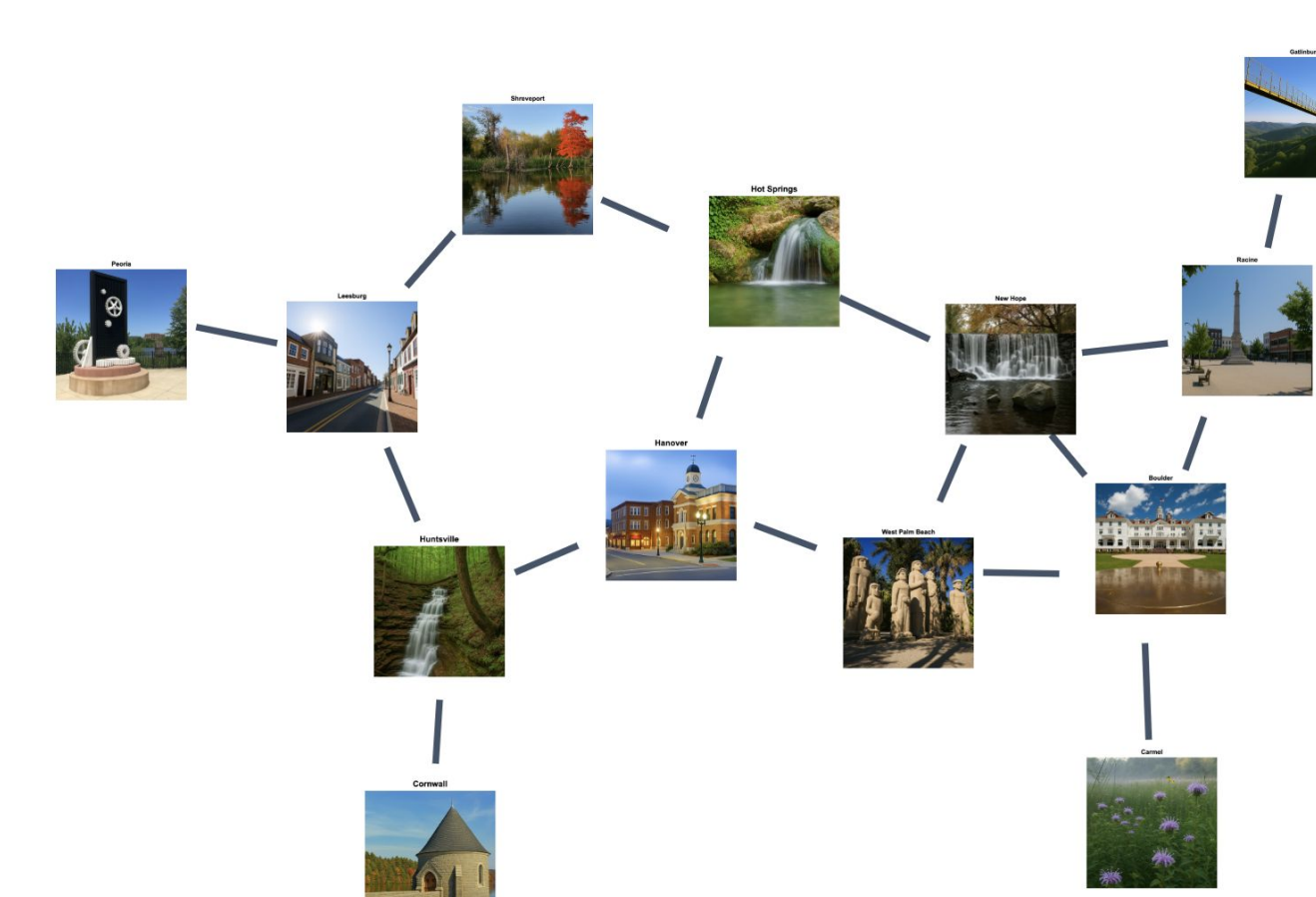


## Experiment 2: Task Framing in Graph Navigation

Arbitrary object condition:



Naturalistic framing condition:



Task Instructions:

“You will be tasked with learning these pairs of objects... a good strategy is to try to imagine a story or image that connects the two objects.”

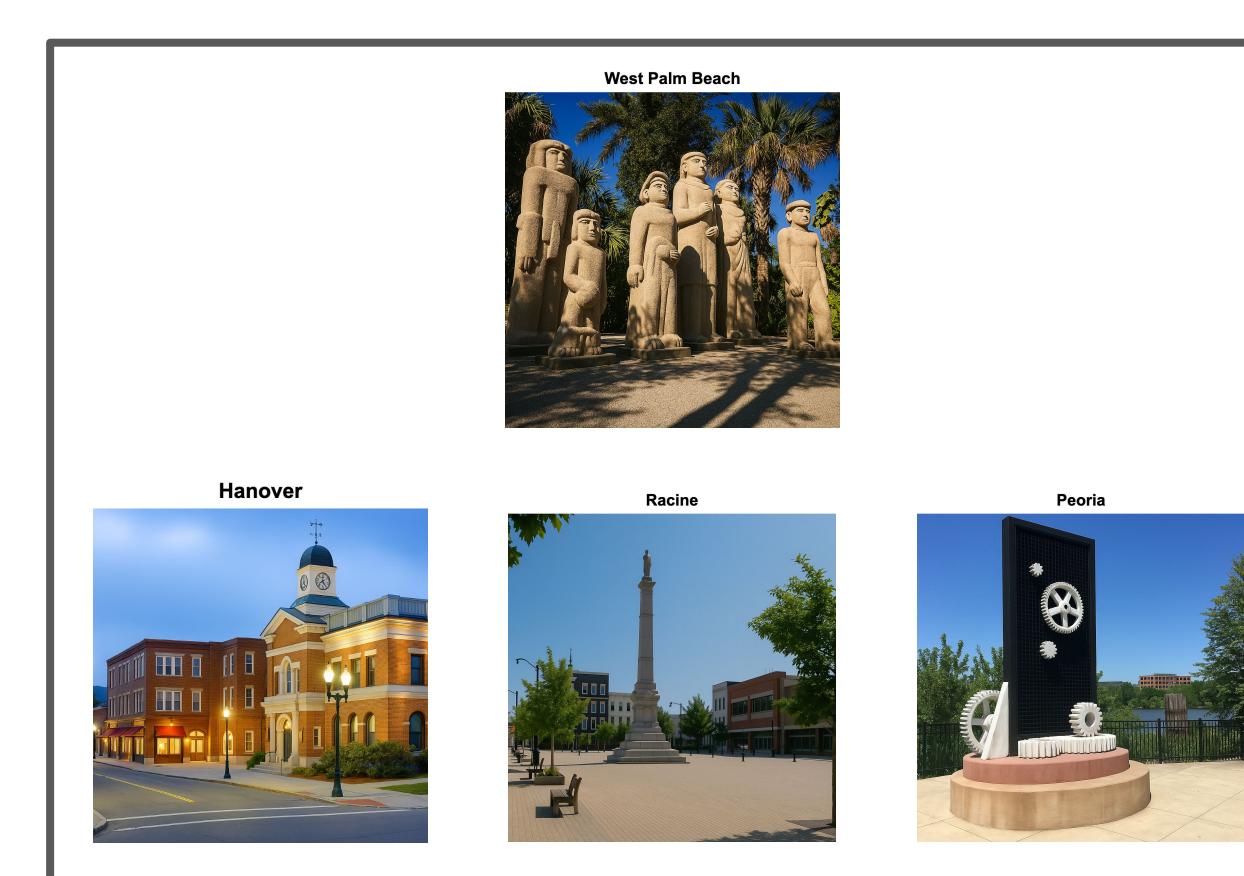
“You are a travel agent who is trying to help your clients make their travel arrangements... your job is to try and learn the direct flights offered by AerBorn Airlines so you can advise your clients to make their travel plans.”

## Task Structure

Learning:

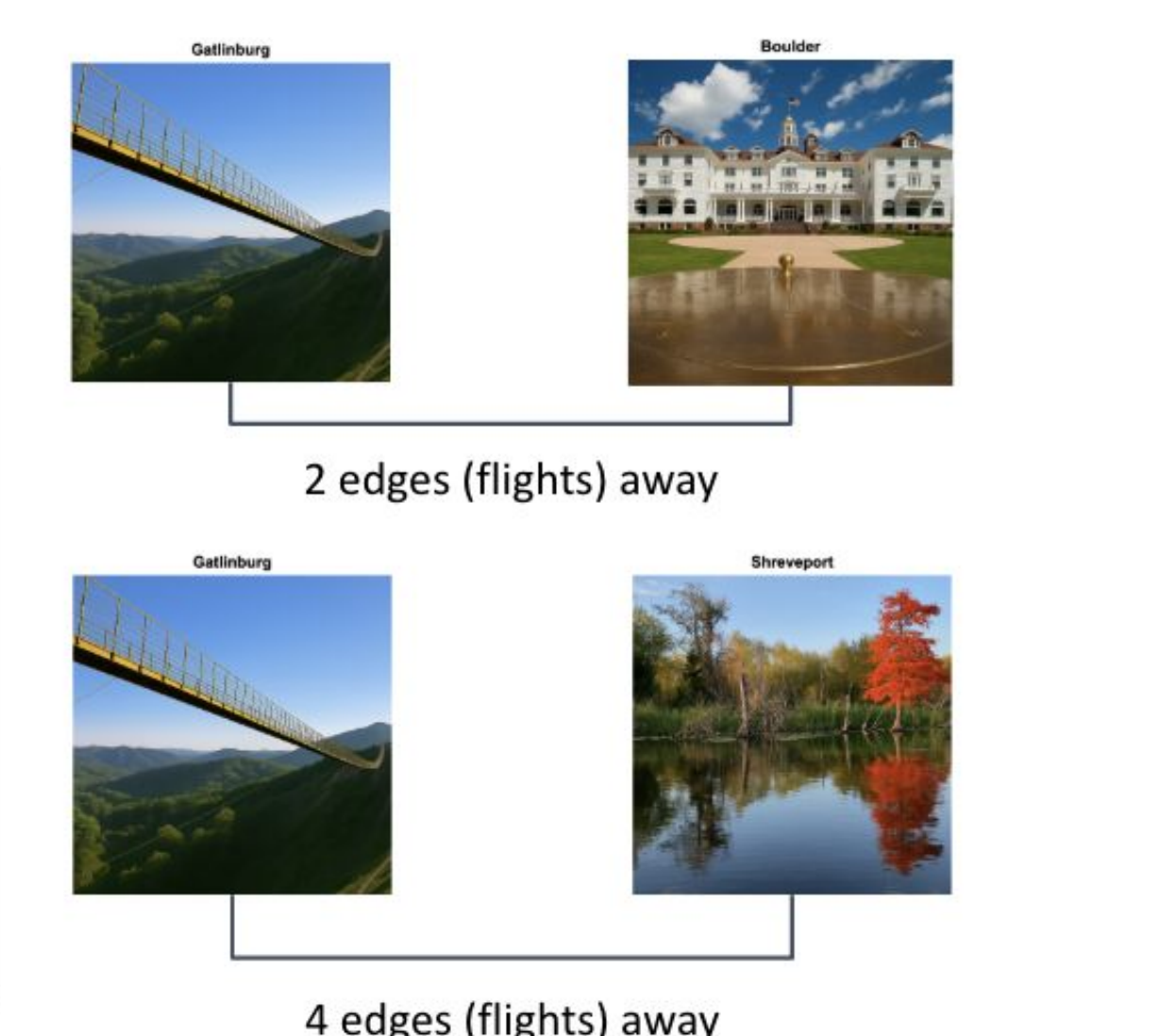
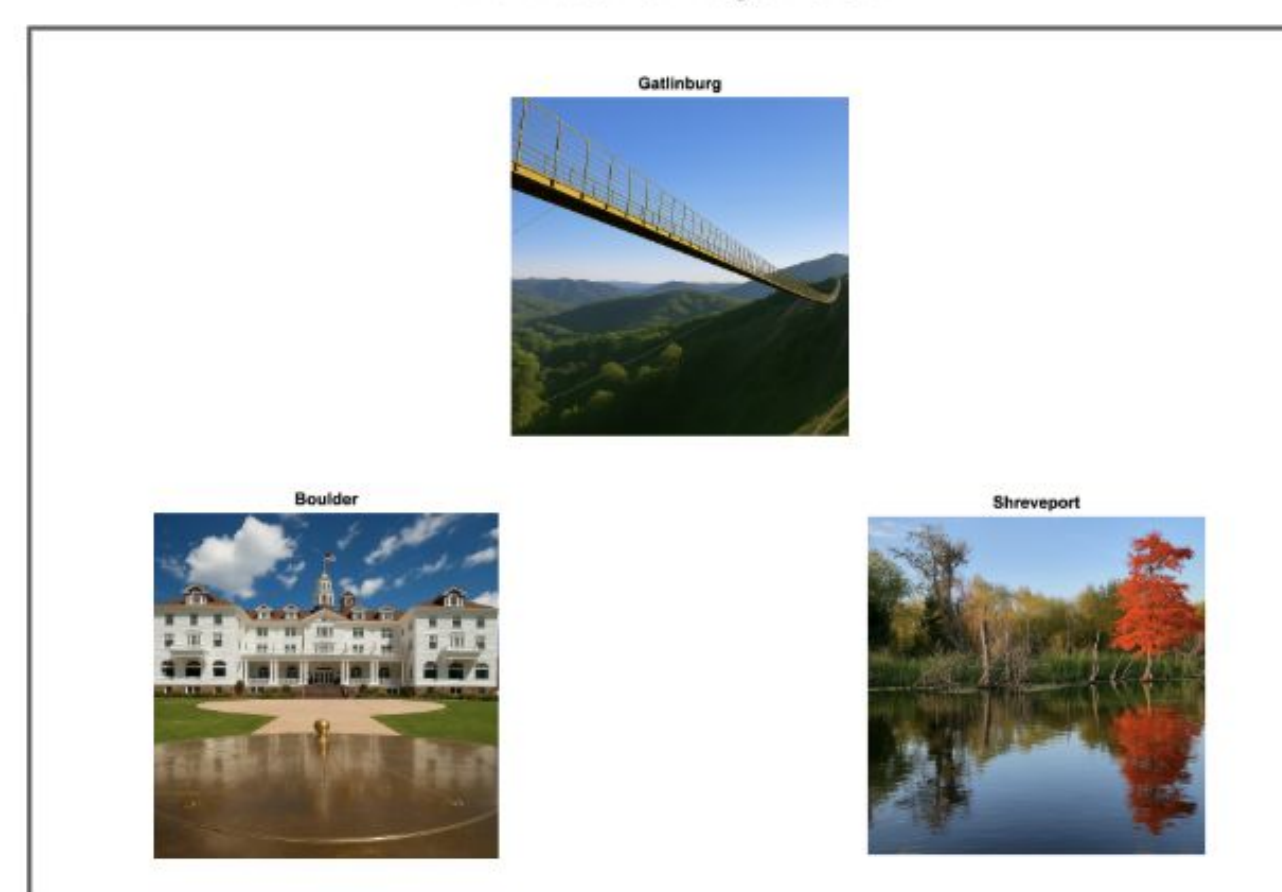


Direct Memory:



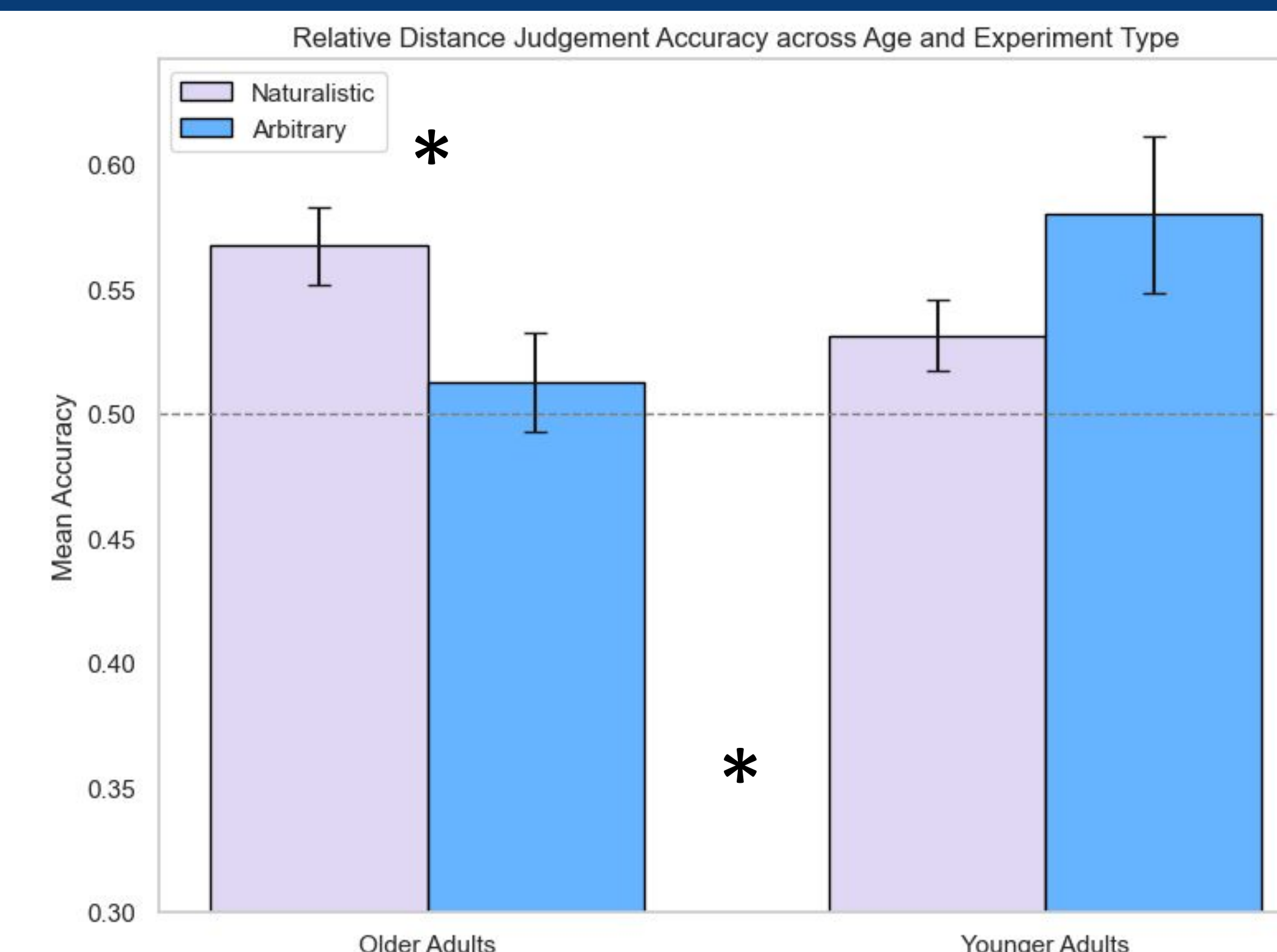
Relative Distance Judgement:

Which destination can you reach that requires the fewest number of layovers?



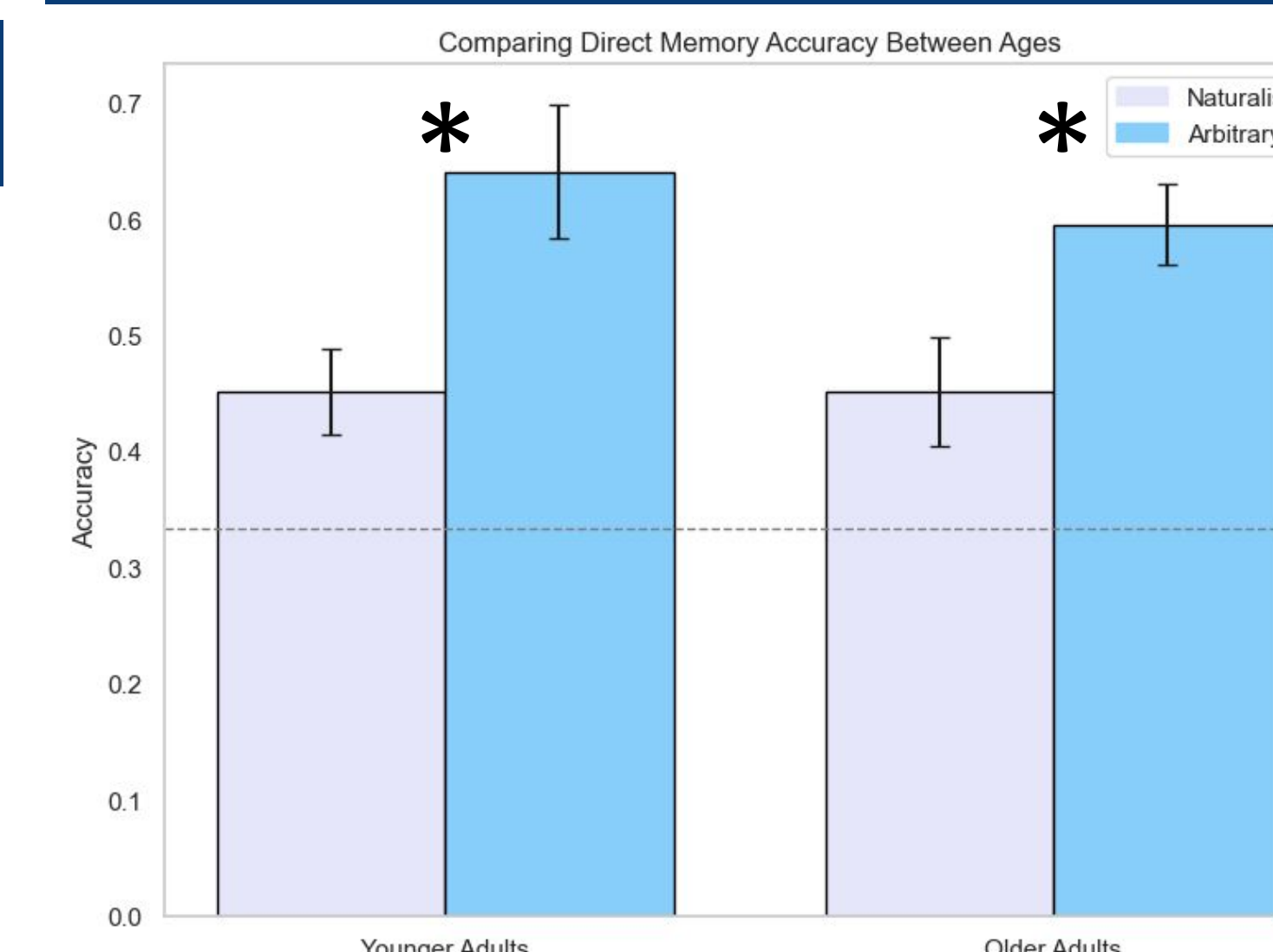
## Experiment 2 Results

There is a significant interaction between Experiment Type and Age during Judgement



2x2 ANOVA on Age:Experiment Type ( $f=4.89$ ,  $p = 0.0312$ )

Direct Memory benefits abstract memory pairs



Main Result

Direct Memory pairs do not show higher performance in the Flights condition across ages, but older adults are performing better at judgement/navigation when the task is framed in a more naturalistic setting.

## Discussion

- The interaction between age and experiment type signifies that age-related changes to task performance are dependent on the specific experiment and can be bolstered using proper framing
- Abstract objects may be easier to ‘connect’ than cities, but are more difficult to navigate through, especially for older adults
- Prior knowledge of cities may play a role in this lower direct memory accuracy
- Older adults display a stronger reliance on semantic support, which combined with understandable task framing allow for their performance to be at the level of younger adults
- More participants are needed / will be collected to confirm these initial findings
- Future analyses will see if the difficulty of distance judgements shows any age-related or task-related differences

## Conclusion

**Naturalistic task framing improves older adults' ability to infer and navigate complex associative networks.**

## References

Castel, A. D. (2005). Memory for Grocery Prices in Younger and Older Adults: The Role of Schematic Support. *Psychology and Aging*, 20(4), 718-721. <https://doi.org/10.1037/0882-7974.20.4.718>

Desrichard, O., & Kopetz, C. (2005). A threat in the elder: The impact of task instructions, self-efficacy and performance expectations on memory performance in the elderly. *European Journal of Social Psychology*, 35(4), 537-552. <https://doi.org/10.1002/ejsp.249>

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## Acknowledgements

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