

LONG-TERM MEMORY RETENTION OF LANDMARK AND ROUTE KNOWLEDGE

ACQUIRED TWO YEARS PRIOR FROM A SINGLE EXPOSURE TO A
REAL-WORLD ROUTE DURING A MAP-AIDED NAVIGATION TASK

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THE TEST STUDY HERE:



INTRODUCTION

- In our spatially enabled society, we rely on ubiquitous mobile map aids to guide us to our destination [6]. Habitual use and over-reliance on map aids impairs our short- and long-term spatial memory formation and retention [1, 5].
- Depicting landmarks on maps is an increasingly popular countermeasure to the negative effects navigation aids have on components of spatial navigation and human cognition [3].
- Landmarks serve as cognitive anchors that facilitate wayfinding and the long-term mental representation of the environment's layout [2, 4].
- Longitudinal studies assessing wayfinders' long-term spatial memory retention after real-world navigation tasks, aided by mobile maps enriched with landmark information, are scarce.

The present study

- In an initial test study, 46 participants navigated once a predefined real-world route prescribed to them on a mobile map aid approx. two years ago [3].
- The test study used a within-subject design where 10 landmarks were saliently depicted on the map as abstract or realistic 3D symbols (IV) [3].
- The present longitudinal retest study assessed wayfinders' long-term retention of landmark and route knowledge (DV) acquired in the initial test study.

Research question: "How well do participants retain spatial knowledge acquired two years ago after a single exposure to a real-world route during a map-aided navigation task?"

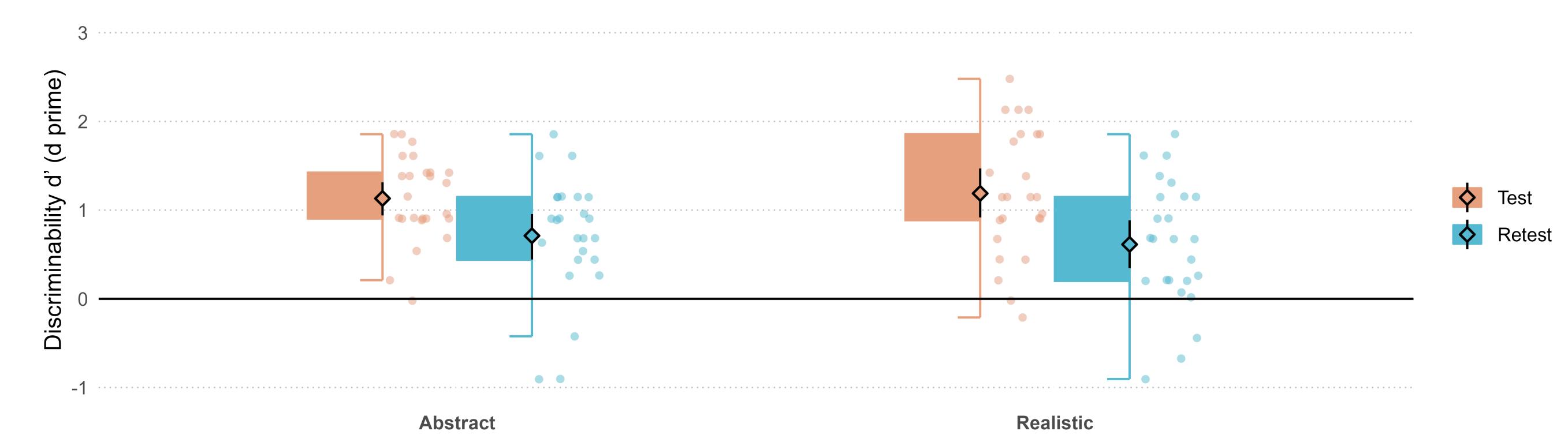
METHODS

- 25 participants ($f = 12$; $M \text{ age} = 29.84 \pm 5.27$ years) returned for the present retest study (mean delay between study sessions = 725.2 ± 15.77 days).
- Landmark Knowledge Test presented 30 building images—10 shown on the map and seen on the route, 10 seen on the route, and 10 novel. Participants indicated if they saw it and, if so, if it was depicted on the map [3].
- Route Knowledge Test presented the 10 images of the landmarks depicted on the map, and participants recalled the turning direction at the landmark.

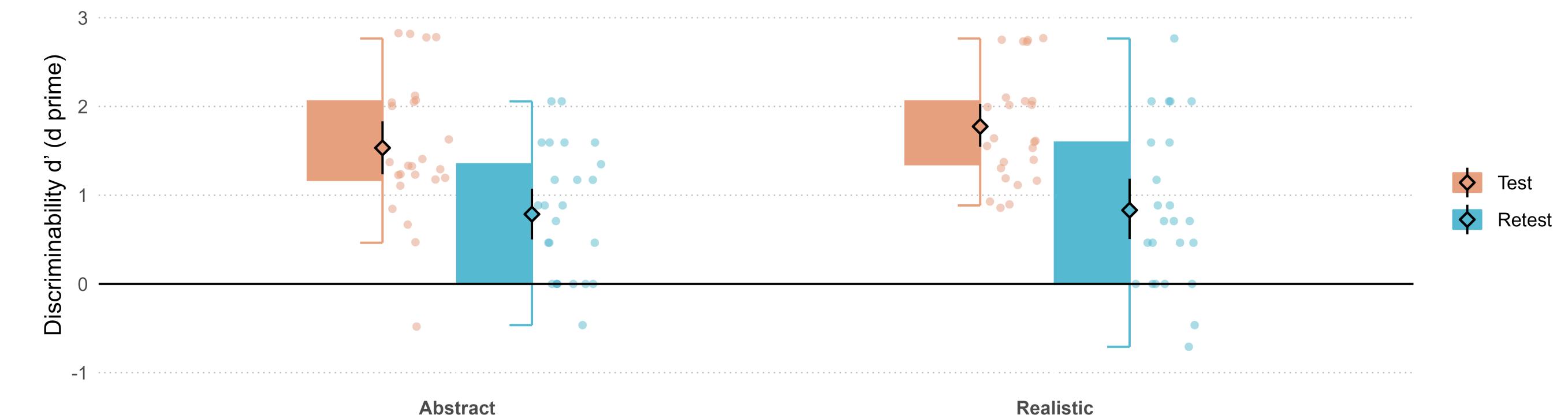


RESULTS

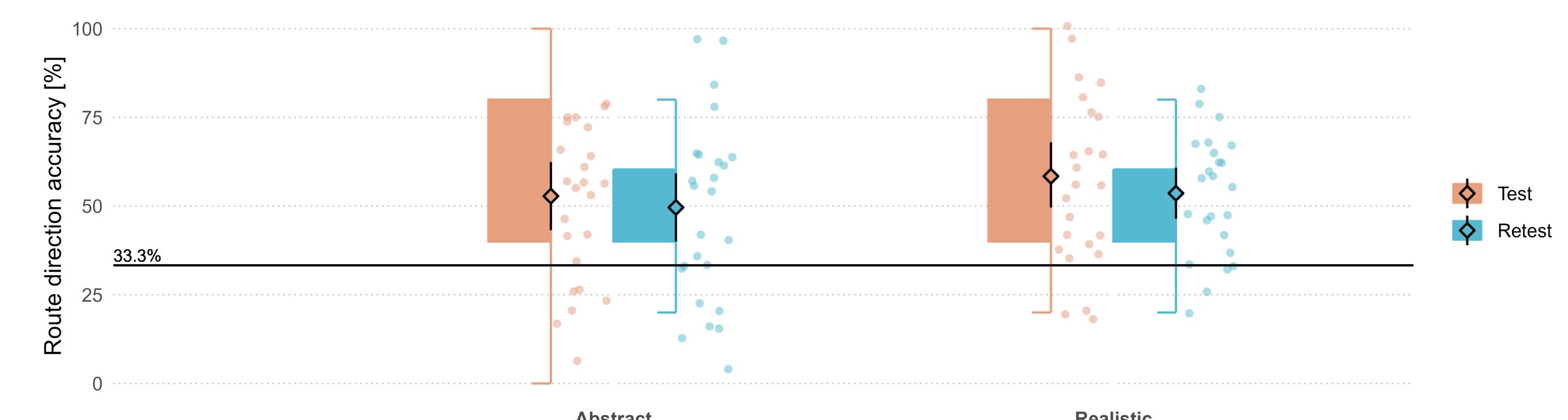
- Long-term memory retention of the landmarks seen in the environment was above chance and declined over time, regardless of the condition.



- Long-term memory retention of the landmarks seen on the mobile map was above chance and declined over time, regardless of the condition.



- Long-term memory retention of route knowledge was above chance and remained unaffected over time, regardless of the condition.



CONCLUSION & OUTLOOK

- Taken together, the results show that wayfinders retain remarkable long-term spatial memory two years after a single exposure to a real-world route aided by a mobile map enriched with landmark information.
- Spatial memory retention was not affected by the landmark visualization style.
- In future work, we plan to investigate the influence of spatial abilities [3] and GPS reliance and dependency [1] on the long-term retention of landmark, route, and survey knowledge.

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