subway

summary, 21st of june

questions

- do we represent spatial problems in a hierarchical way? how is this representation encoded in the brain?

- how do we achieve goal-directed planning?

hypothesis

- information bottlenecks
- consistency (by episodic memory)
- high entropy and surprise

method

- fMRI
- subway task:
  - hierarchy is forced as network → lines → stations
  - training with coloured maps
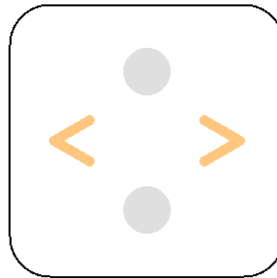 - scanner with a black/white interface

the task
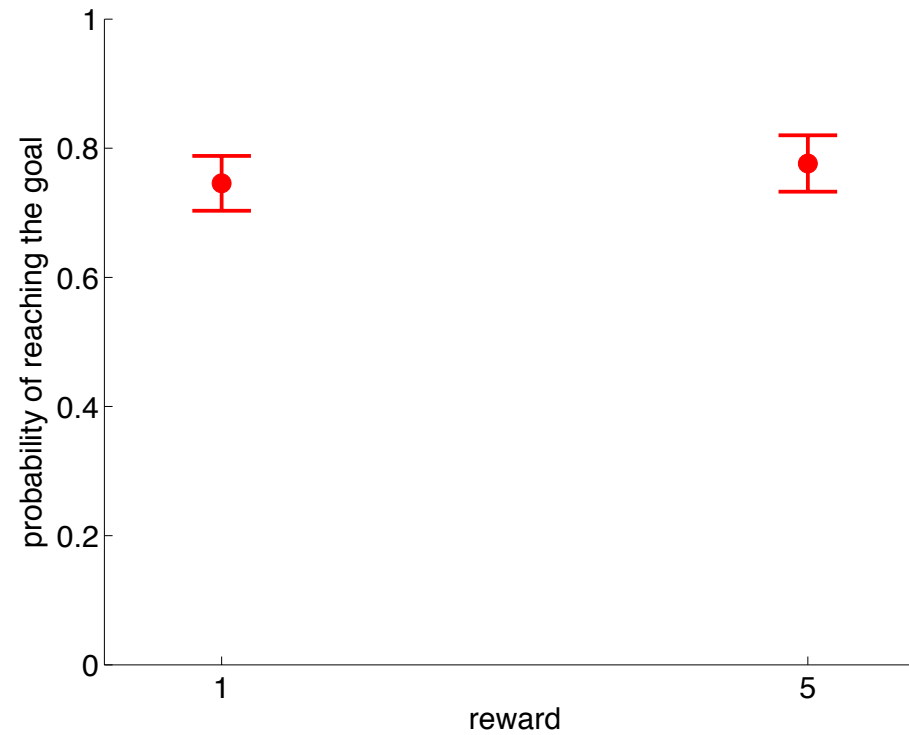
Edgar Allen Poe Station

this is

Michelangelo Station
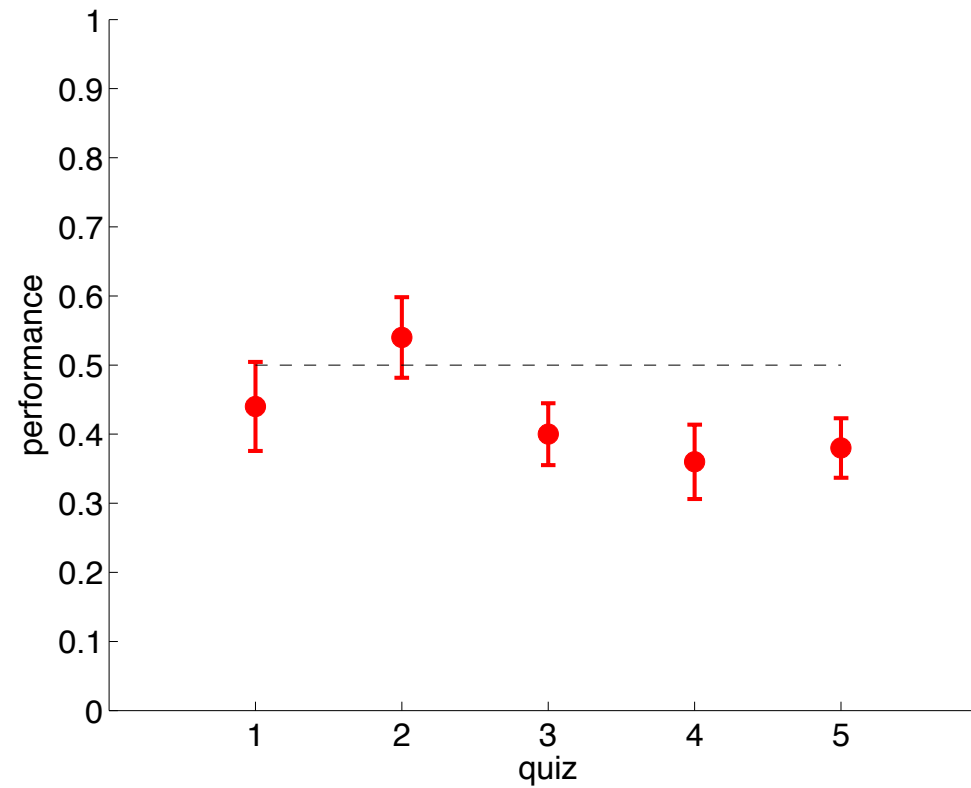
exchange for

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1st pilot – 15th april

- N = 5
- 1500 trials
  - 750 learning
  - 750 reward (1 or 5£ if goal achieved on time)
- 5 quizzes of 10 questions
- from/to endpoints
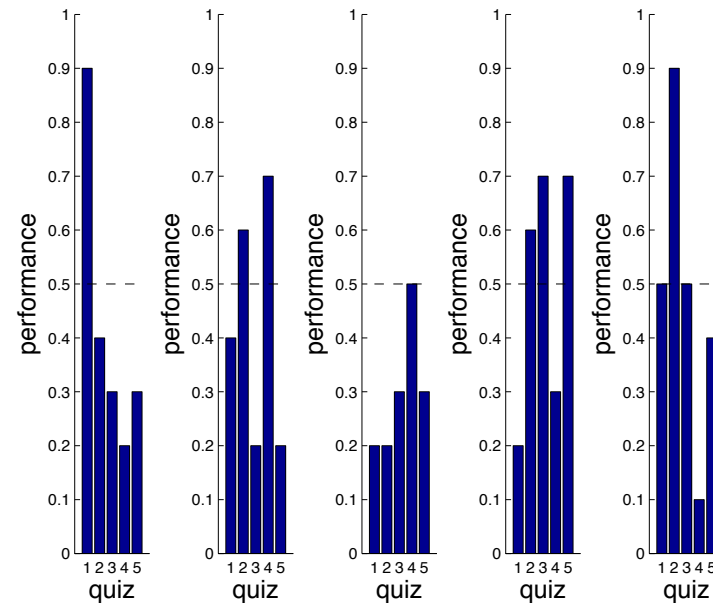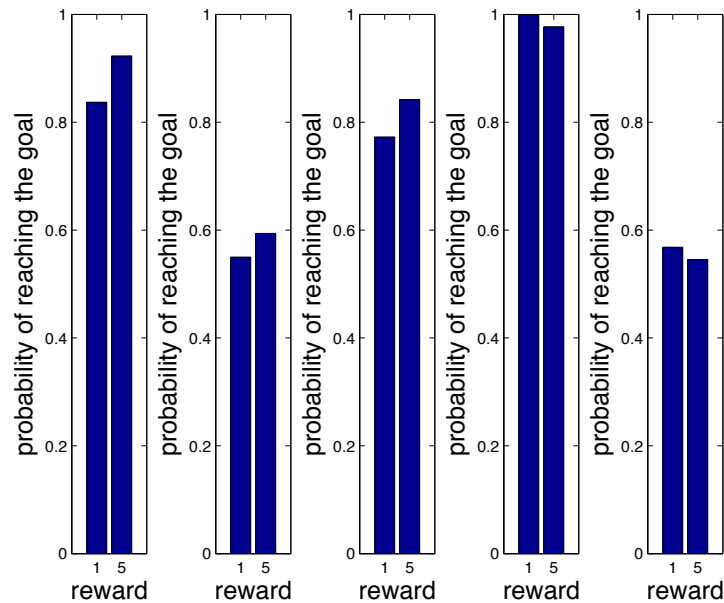- randomly-generated maps

1ˢᵗ pilot – 15ᵗʰ april

No effect of reward

1ˢᵗ pilot – 15ᵗʰ april

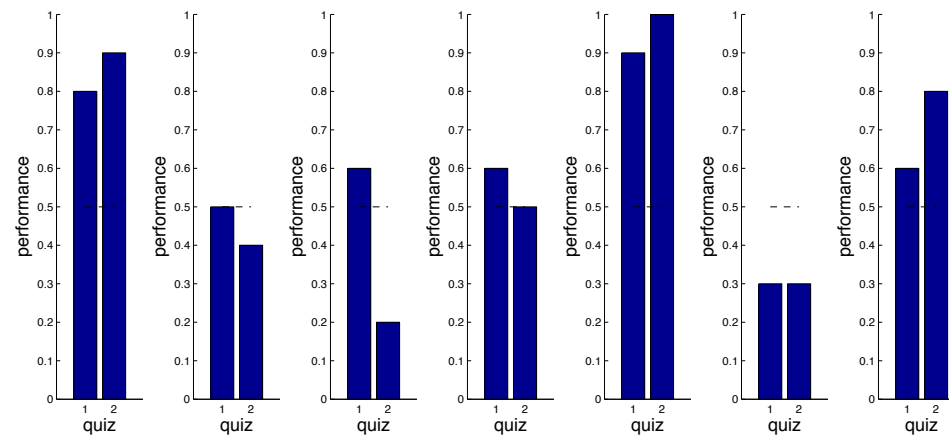## No learning

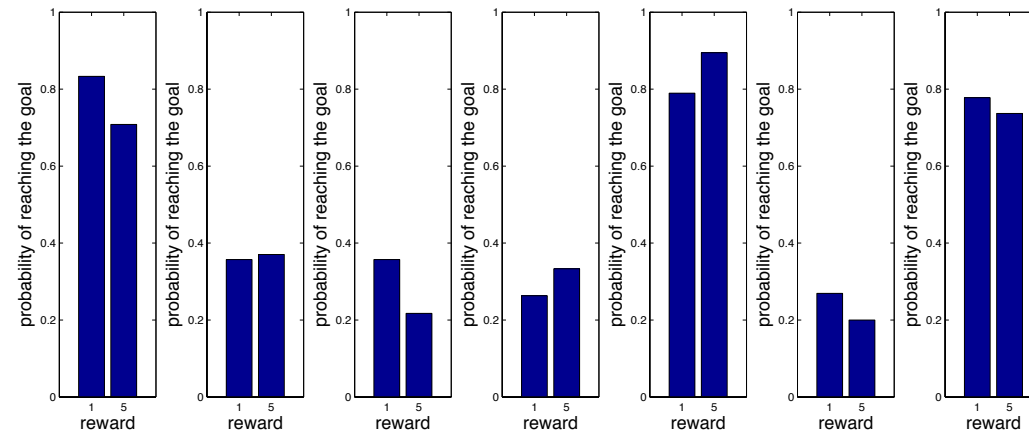# 1ˢᵗ pilot – 15ᵗʰ april

Some seem to learn. Poor quizzes overall?

2nd pilot – 22nd april

- N = 7 (1 common to the first pilot)
- 800 trials
  - 400 learning
  - 400 reward
- 2 quizzes of 10 questions
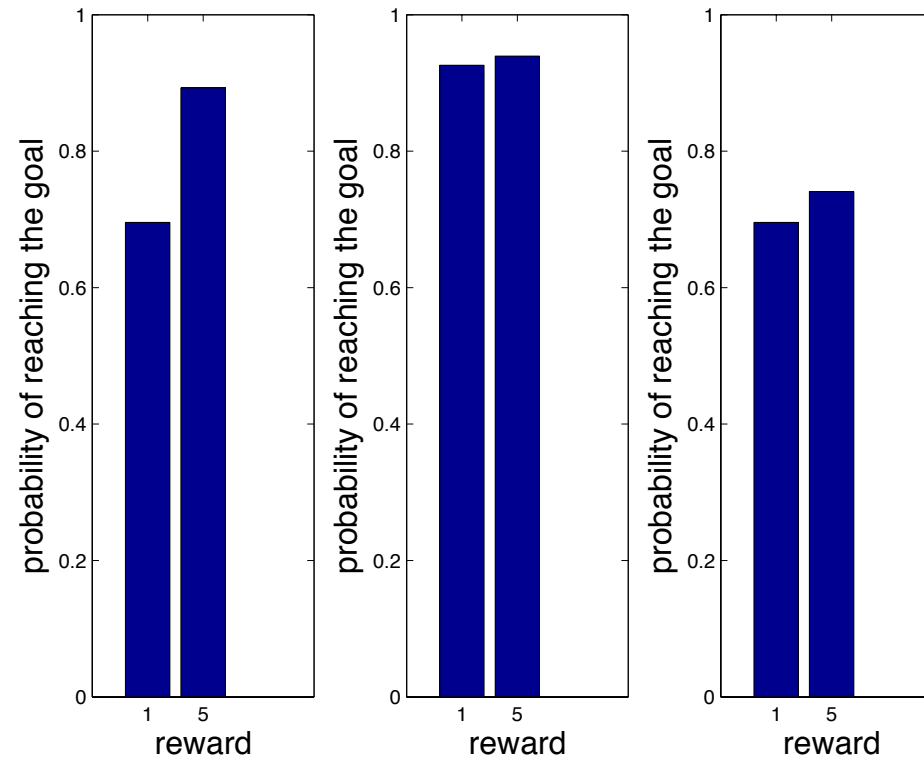- waiting time for switch lines

2nd pilot – 22nd april
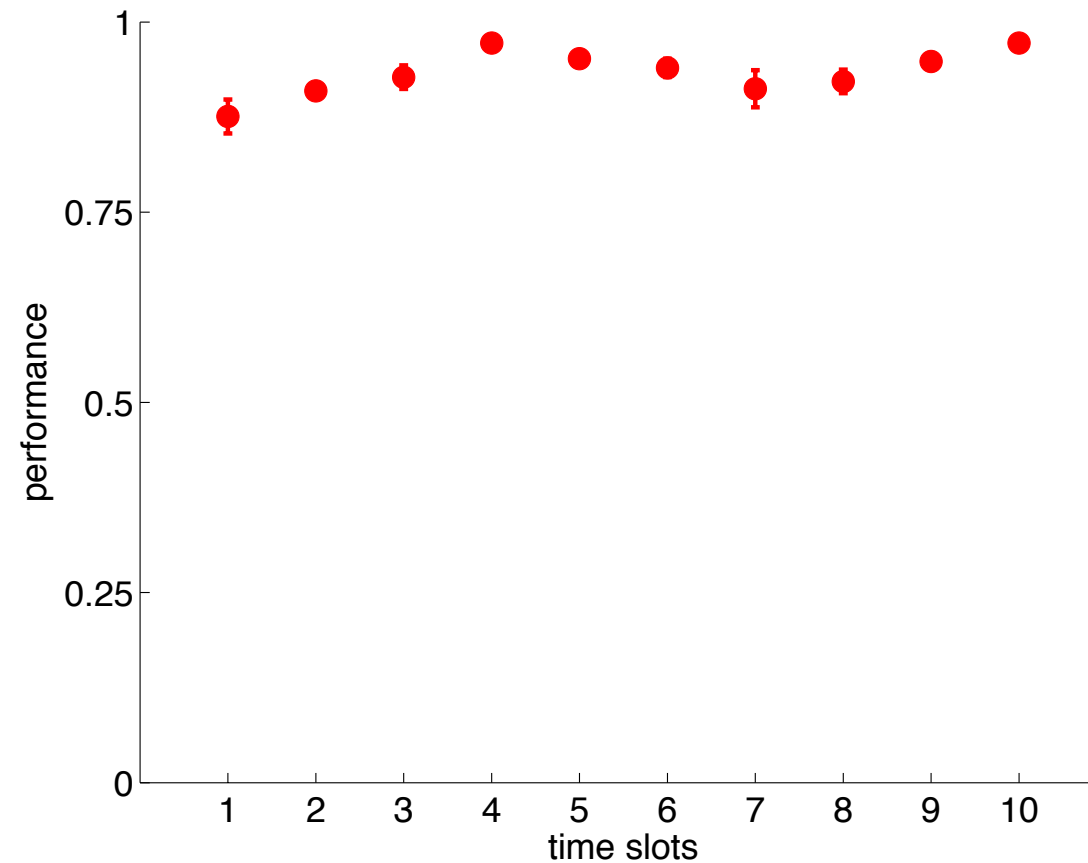
2nd pilot (bis) – 24th april

- N = 3 (the best from the 2nd pilot)
- 1000 trials
  - 500 warm-up (colour)
  - 400 reward (black/white)
- 5 quizzes of 15 questions
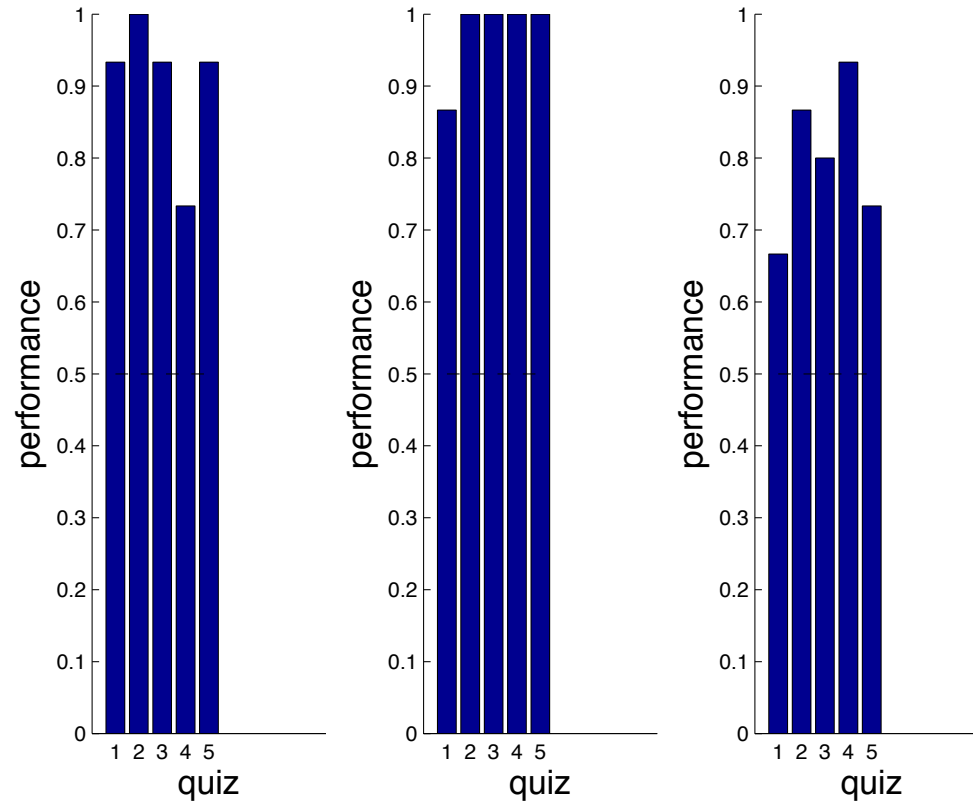- maps they had in their previous session

2nd pilot (bis) – 24th april

Small effect of reward?

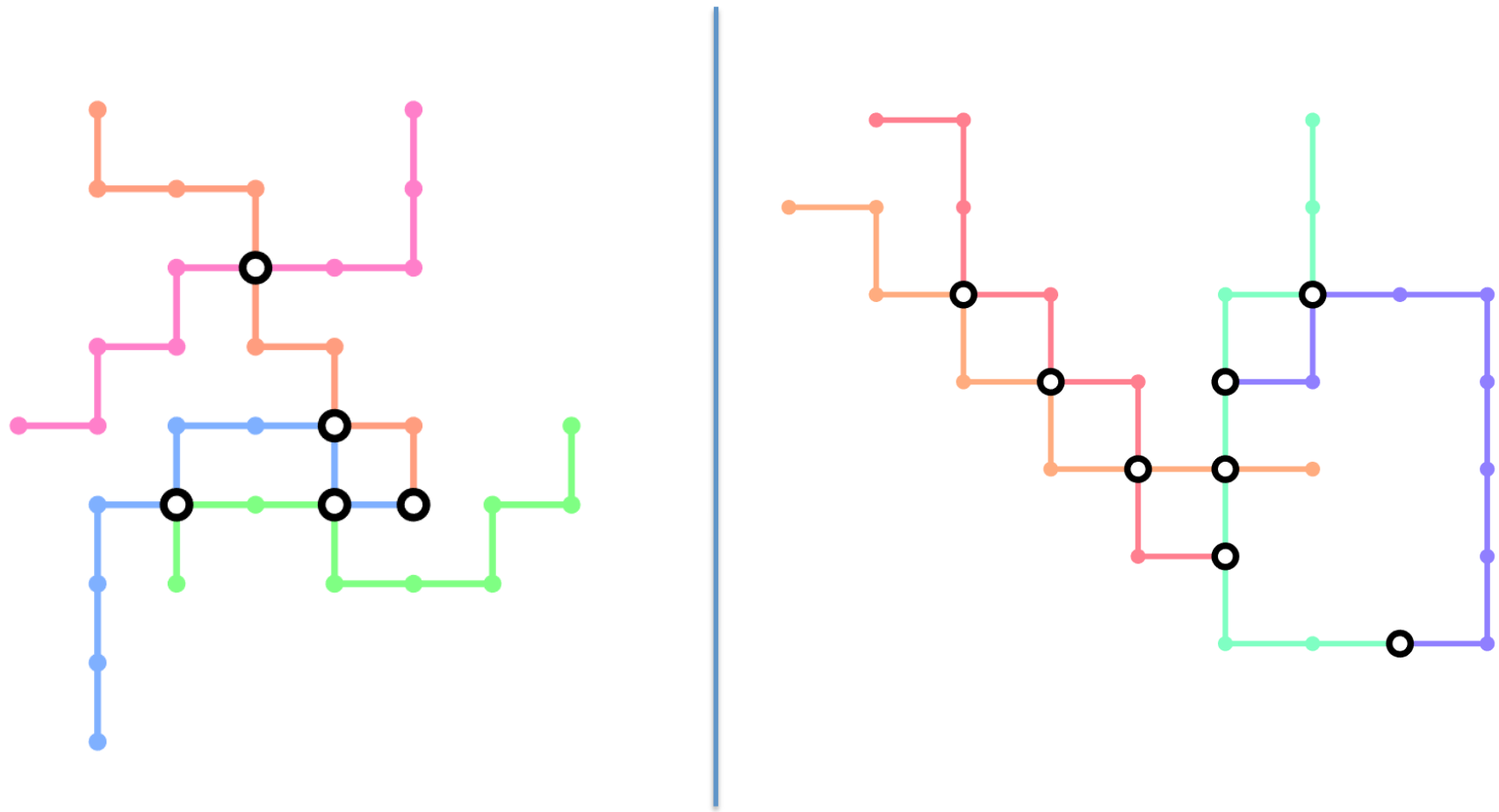# 2nd pilot (bis) – 24th april

Still some learning?

2nd pilot (bis) – 24th april
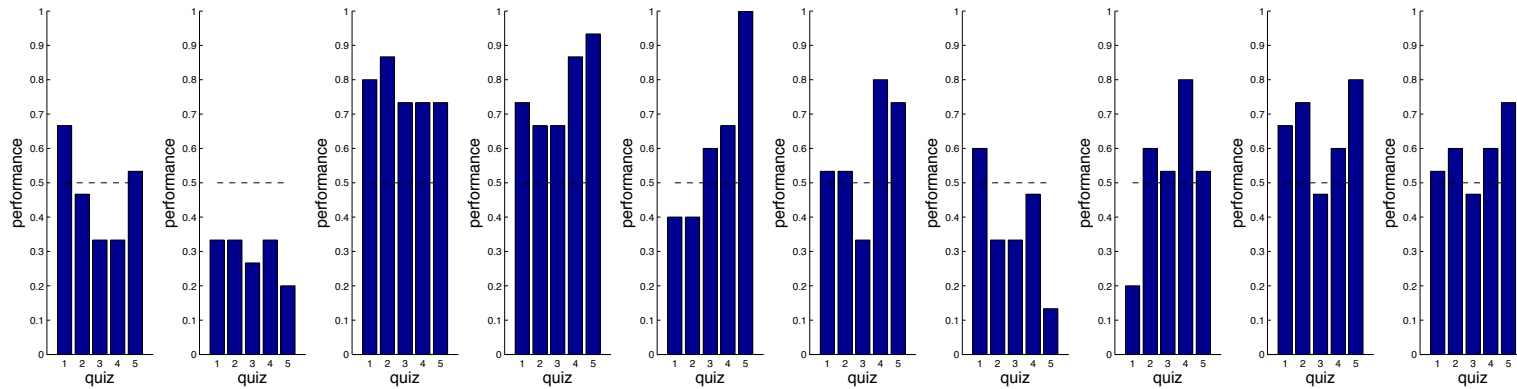

quizzes are good!

2ⁿᵈ pilot (bis) – 24ᵗʰ april

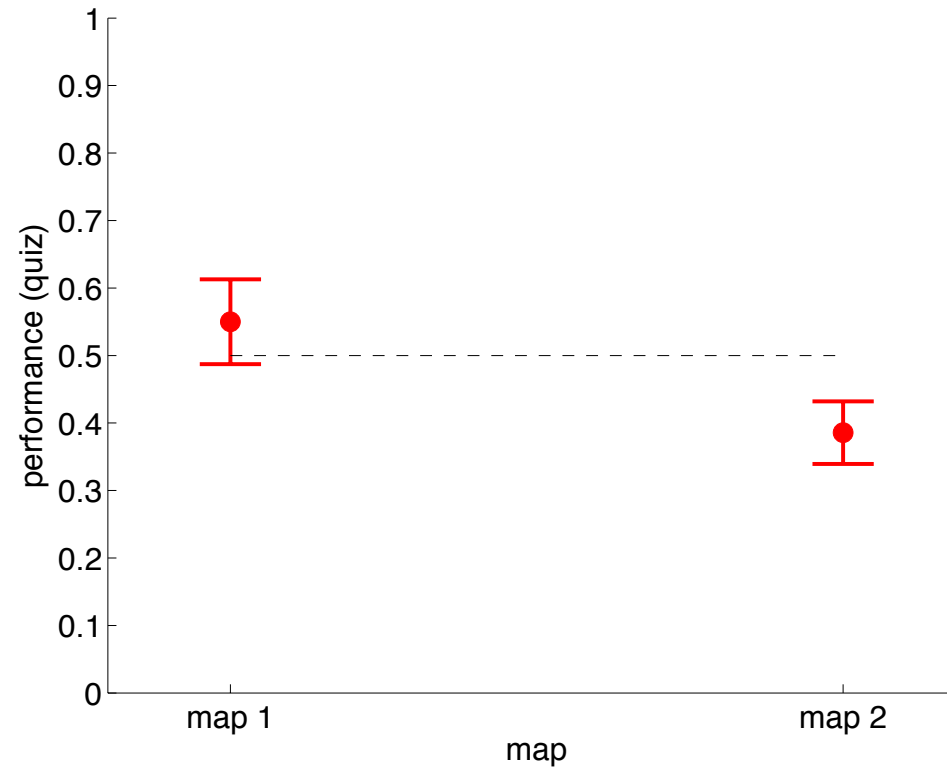# 3rd pilot – 1st may

- N = 11 (all new but 3)
- 1000 trials
  - only learning
- 5 quizzes of 15 questions
- two maps (one from before + a new one)

3rd pilot – 1st may

again, only some of the participants
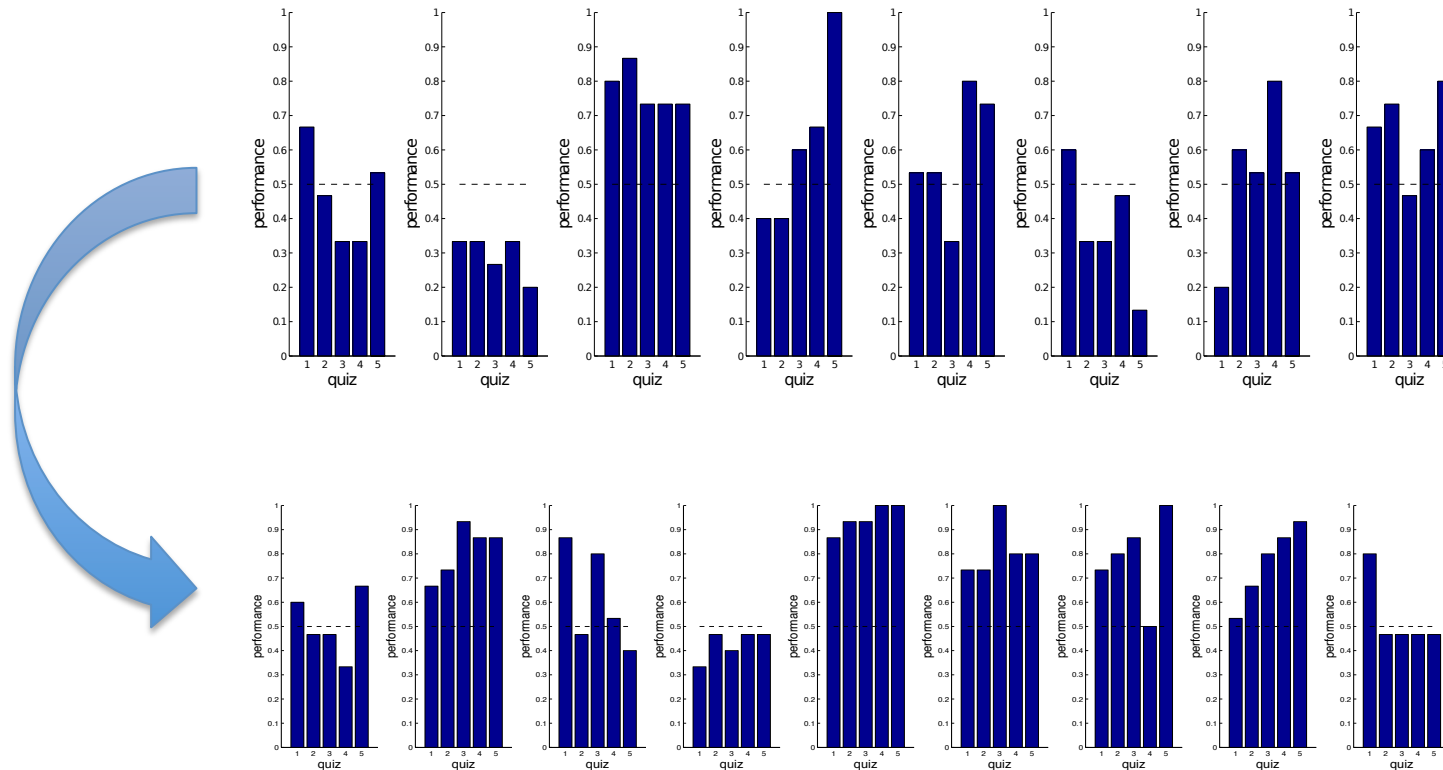achieve the good level of performance

3rd pilot – 1st may

doesn't seem to be because of the kind of map

3rd pilot (bis) – 6th may

- N = 9 (second session, after 6-21 days)
- 1000 trials
  - only learning
- 5 quizzes of 15 questions
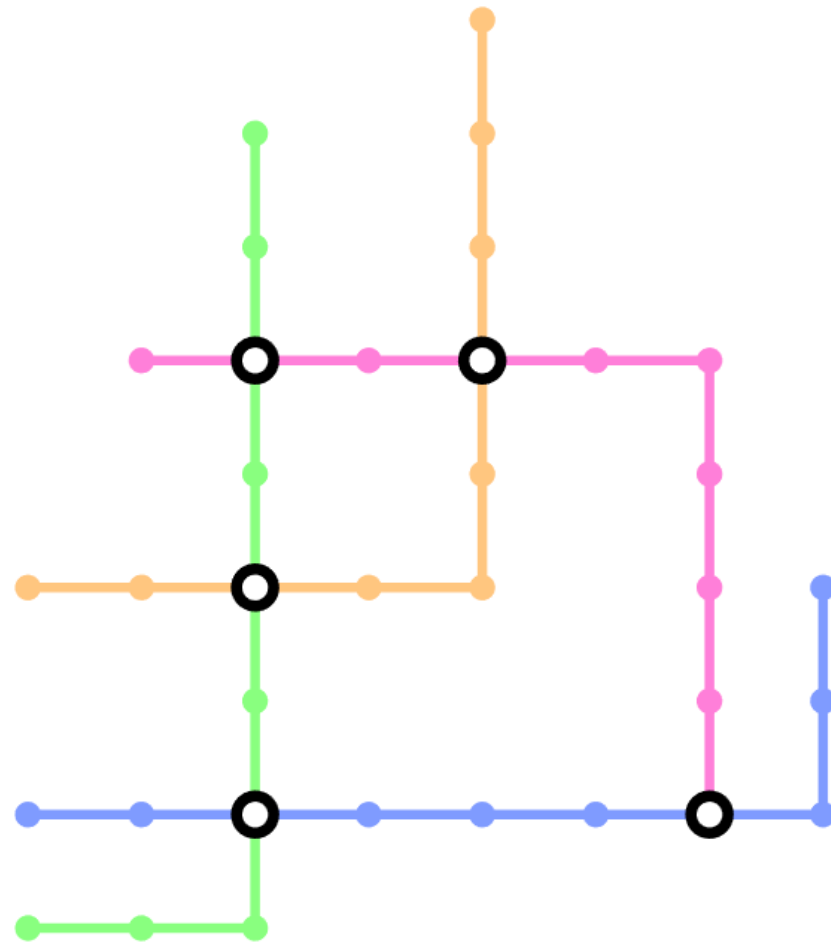- (same maps)

3ʳᵈ pilot (bis) – 6ᵗʰ may

not a big improvement on the quizzes…

4th pilot – 29th may

- N = 4 (all new)
- 1000 trials
  - only learning
- one single map, hand-made
  - 4 lines
  - 35 stations
  - 5 change-points
  - 4 changes of direction

again, only 2/4 could learn the map

4th pilot – 29th may

5th pilot – 18th june

- N = 6 (all ~new)
- 2 sessions, 50 minutes each
  - first session: long memory + learning
  - second session: short memory + learning + quizzes
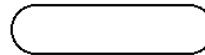- one map
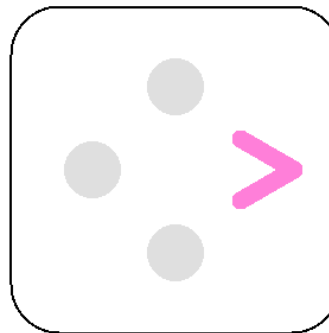
Line to

Abraham Lincoln Station

meeting at

Abraham Lincoln Station

this is

exchange for

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Vladimir Putin

Oprah Winfrey

Ludwig van Beethoven

C. S. Lewis

John F. Kennedy

James Dean

Fred Astaire

Edgar Allen Poe

Jane Austen

Abraham Lincoln

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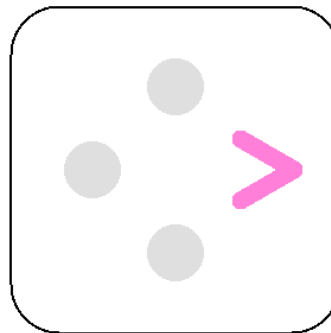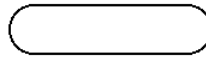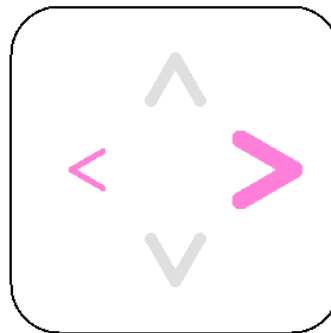Abraham Lincoln

meeting at

Abraham Lincoln Station

this is

exchange for

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Oprah Winfrey

John F. Kennedy

James Dean

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Vladimir Putin

Jane Austen

Ludwig van Beethoven

Abraham Lincoln
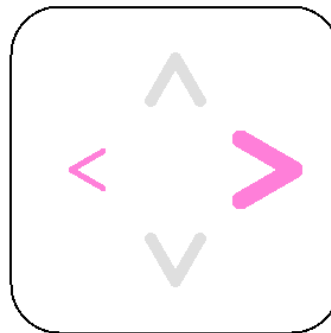
meeting at

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Vladimir Putin Station

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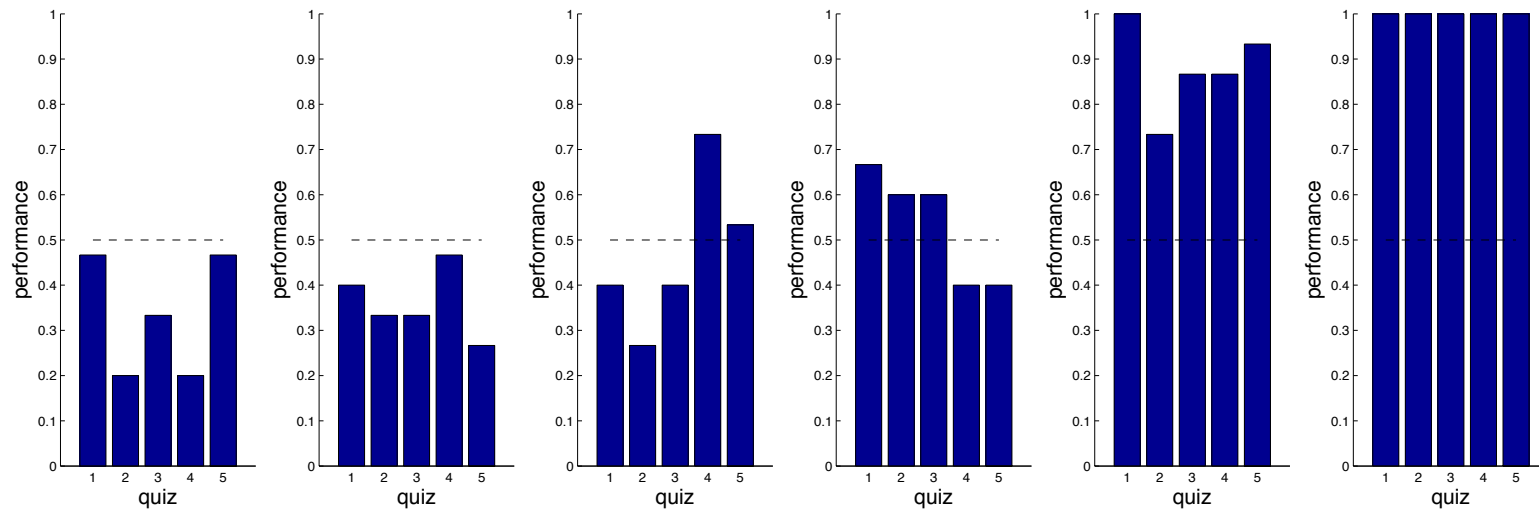
James Dean

Edgar Allen Poe

Fred Astaire

C. S. Lewis

Vladimir Putin

Jane Austen

Ludwig van Beethoven

Abraham Lincoln

5th pilot – 18th june

again…

next?

- maybe using only the participants who can learn the map?