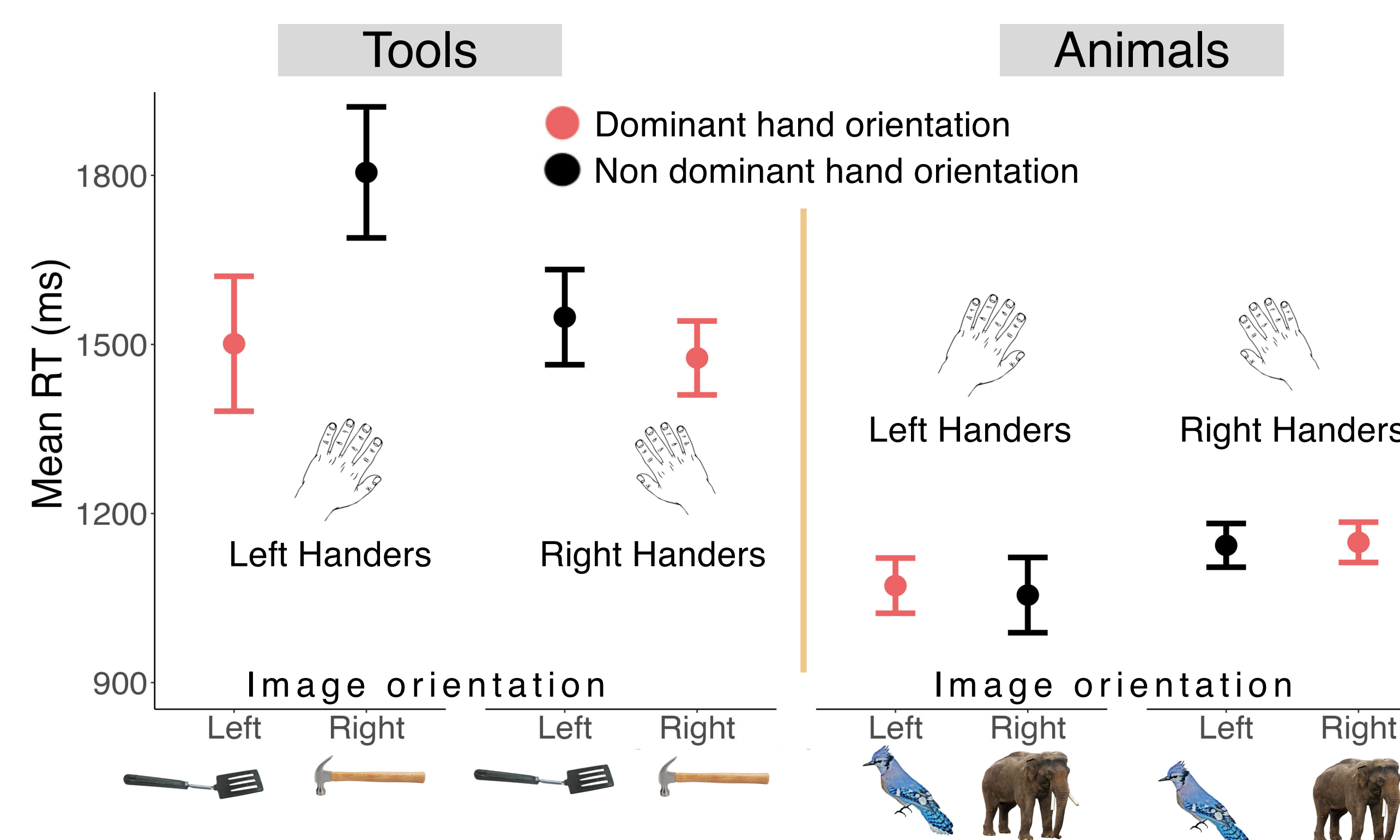


Are objects oriented towards your dominant hand easier to recognize?

... perhaps when grasping/engaging action planning network, but not when your hands are on your lap ...

1. Introduction

- If conceptual knowledge is formed from our experiences, (e.g., *hammer* from our visual, auditory, somatosensory, and motor experiences with hammers) then different concepts (Barsalou, 1999)
- Handedness** produces different motor experiences for left (LHs) versus right handers (RHs)... **Do these differences affect conceptual knowledge?**
- In prior work, people were faster to indicate how they would grasp an object (e.g., is a *hammer* clenched or pinched?) when it was oriented towards their dominant hand (Chrysikou et al., 2017)
- Does orienting graspable things toward the dominant hand also facilitate thinking about them when simply naming them?** Would motor imagery modulate this?



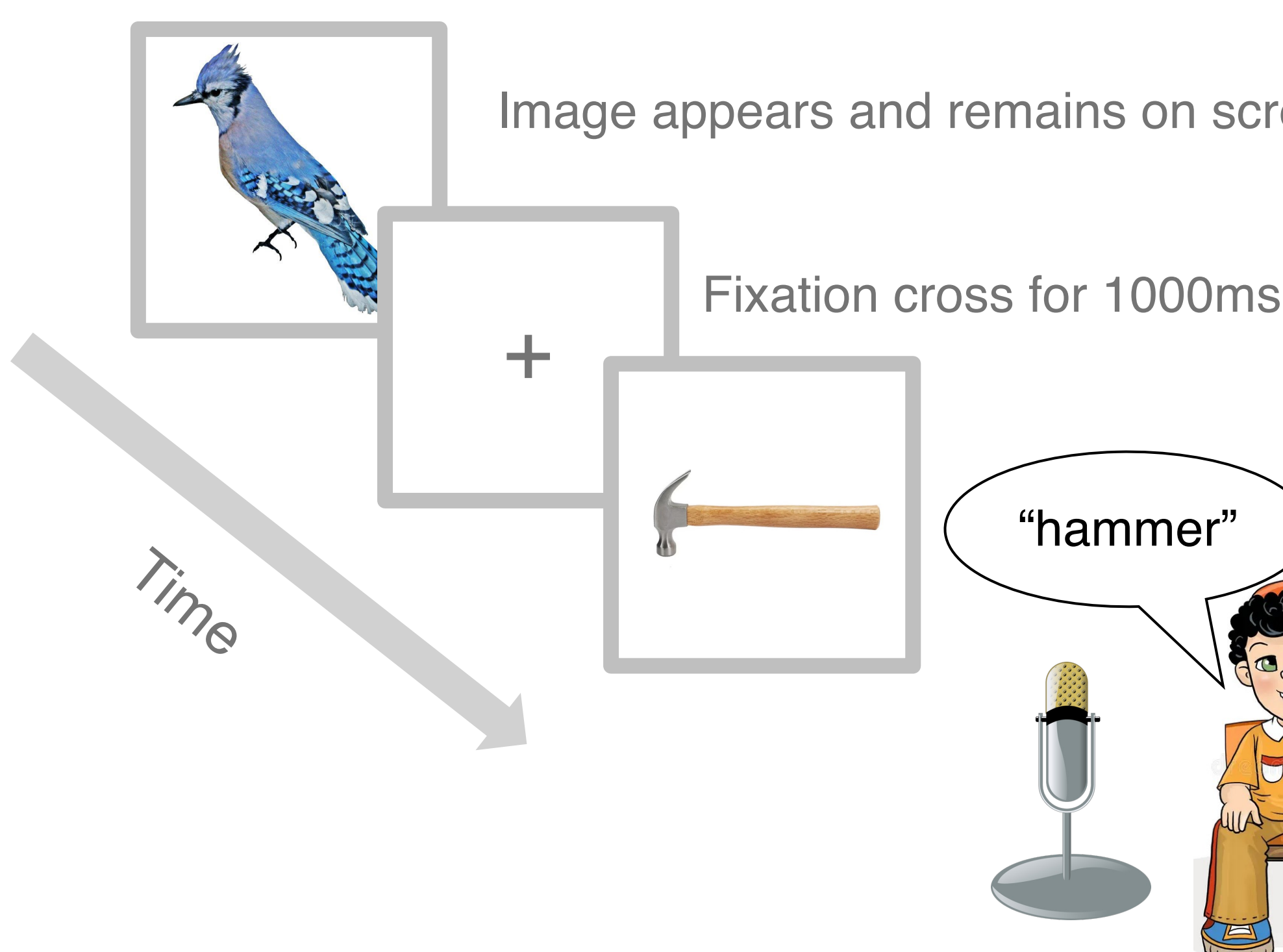
- In preliminary data (from slightly different paradigm with participants grasping “handles”) RHs ($N=27$) were faster to name tools oriented towards their right vs. left hand and vice-versa for LHs ($N=2$) (Lutz et al., 2020)

2. Methods

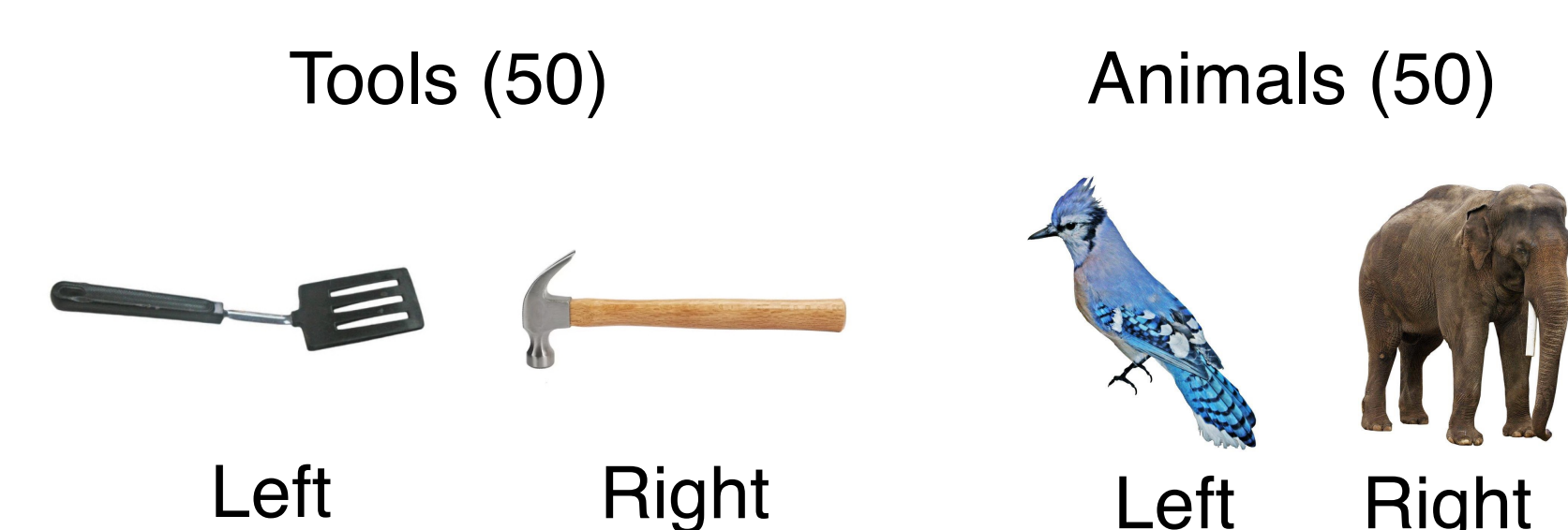
Subjects: 18 RHs, 24 LHs; hands in lap

Data collection ongoing...

Task: Basic level picture naming



Stimuli:



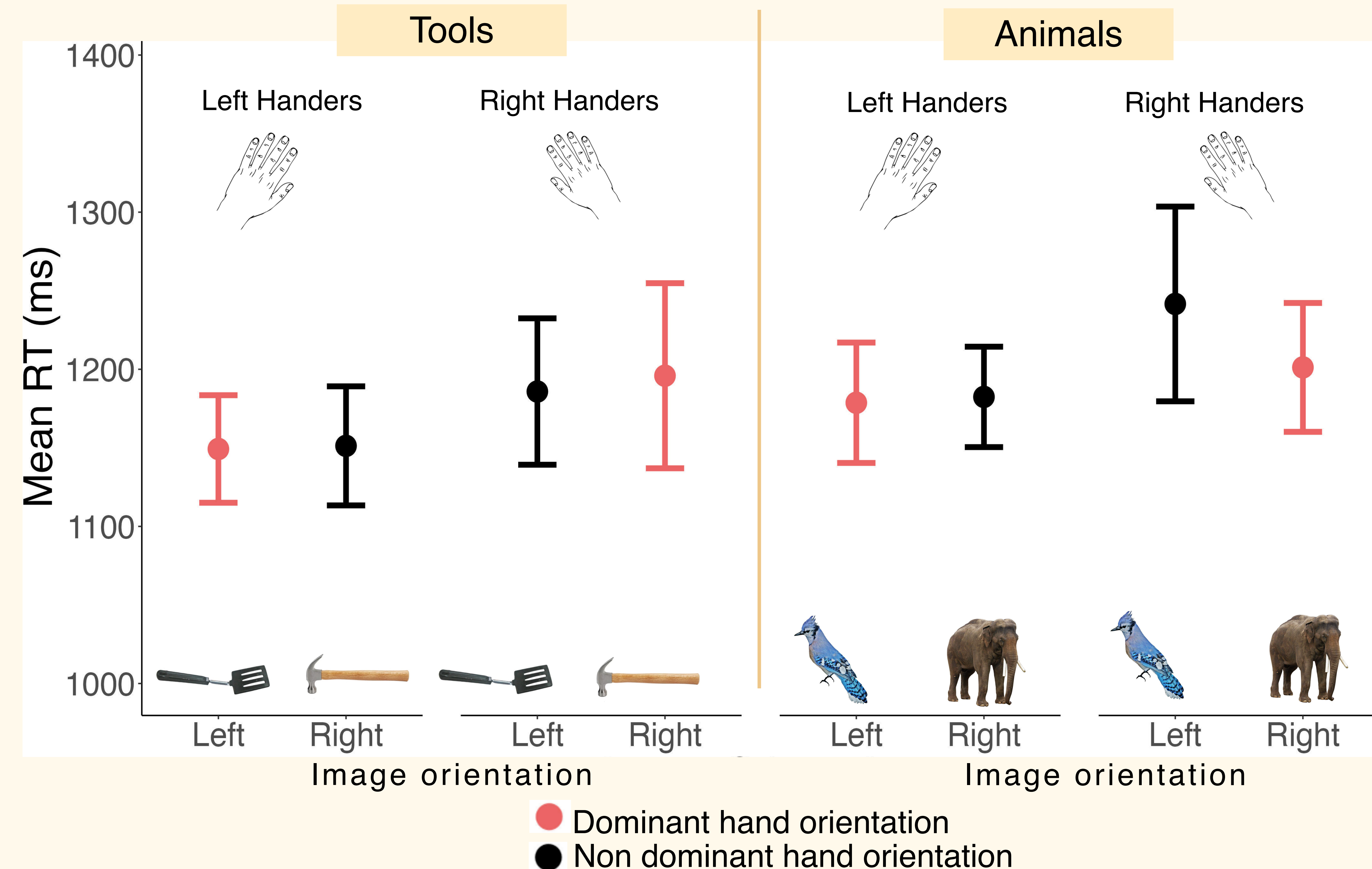
- 2 blocks, 25 tools and 25 animals / block
- Half with handle/head oriented to left, half to right.
- Orientation counterbalanced across 2 lists (fixed random orders)

- Questionnaires:** Edinburgh Handedness Inventory (EHI) & several Motor Imagery measures: Test of Ability in Movement Imagery (TAMI), Visual Motor Imagery Questionnaire 2 (VMIQ-2), Florida Praxis Imagery Questionnaire (FPIQ)

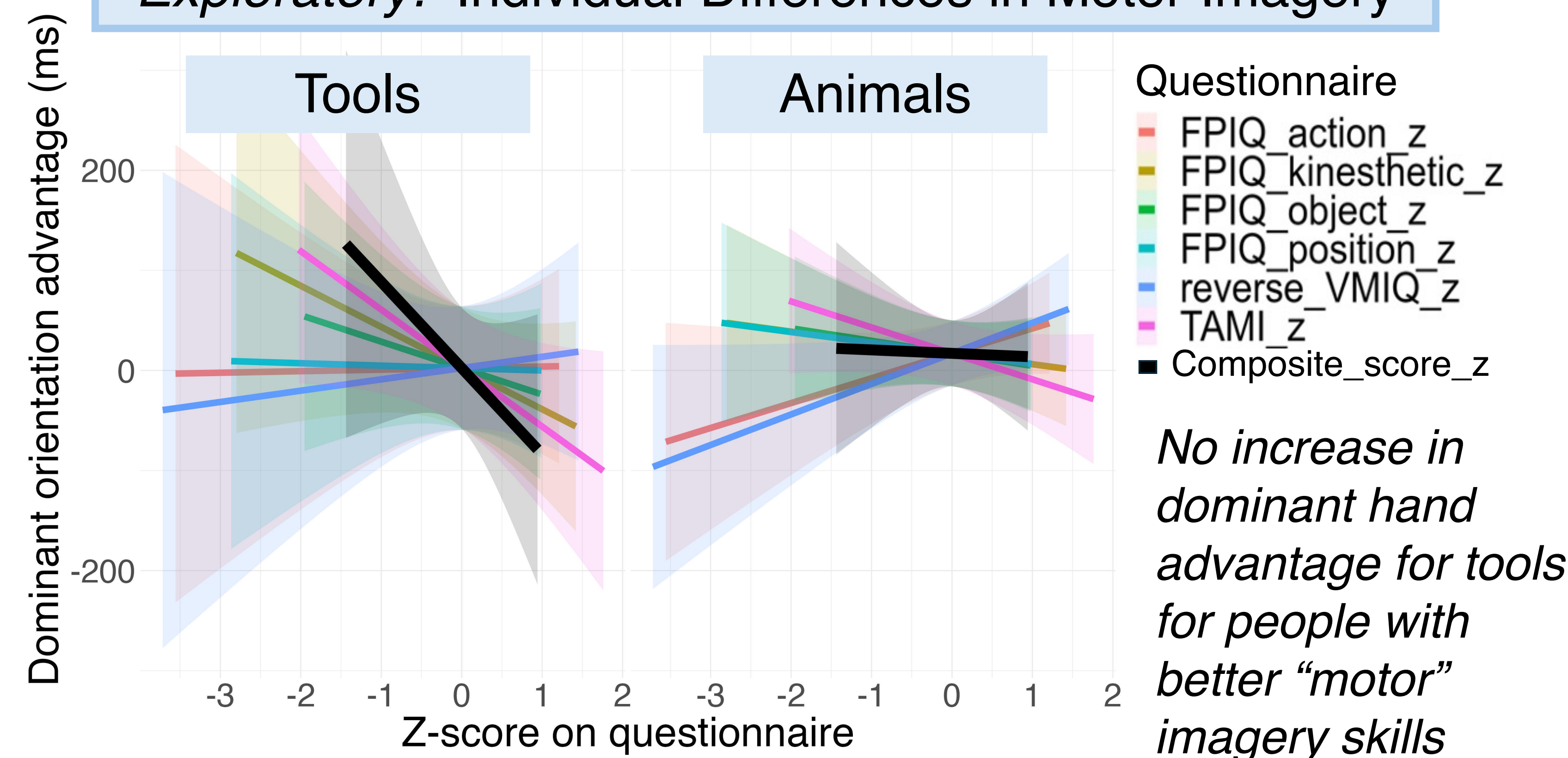
3. Results

No advantage when tools are oriented towards the dominant hand:

Control: No differences when animals are oriented towards the dominant hand:



Exploratory: Individual Differences in Motor Imagery



FPIQ examples

- Action:** Imagine you are using a key to unlock a door. Does your thumb move up and down or rotate?
- Kinesthetic:** Imagine you are using a handsaw. Which joint moves more: your hand or your wrist?
- Object:** Which is wider, a fingernail clipper or a safety pin?
- Position:** Imagine you are writing with a pencil. Which is closer to the paper: your index finger or your pinky?

VMIQ-2 examples

- How well can you visualize watching yourself do the action?, How well can you visualize looking through your own eyes whilst doing the action?, and How well can you feel yourself doing the movement?

TAMI

- Imagining moving different parts of your body and then choose the image that matches posture

Composite Score

- Mean of z-scores for motor imagery

References

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4. Discussion

- Orienting tools toward the dominant hand does not facilitate naming...when hands are in lap
- But dominant hand orientation does facilitate (1) grasp knowledge retrieval³ and (2) naming when grasping “handles” in each hand⁴
- Suggests that action planning network is not *always* activated when thinking about tools (e.g., Bub et al., 2021) ... rather it is context-dependent (e.g., Yee & Thompson-Schill, 2016)
- Whether differences in experience produce differences in conceptual knowledge depends on the relationship between task / context and the knowledge in question

Next...

- Finish data collection (target $N=40$ /group)
- Same task while grasping handles to activate action planning network
- Measure motor skills (rather than motor imagery)