

Epistemic Extrapolation:

Inferring the Fine-Grained Structure of Others' Knowledge From Minimal Evidence

Tracking others' knowledge is crucial to conversation and social navigation.

Knowledge, even in early childhood, is richly structured. (e.g., Gobe & Chi, 1987)

Adults have accurate expectations for what others know in general. (e.g., Nickerson et al., 1987)

Here we ask how *accurately* we update our expectations of what specific others know as we get evidence.

We introduce a novel paradigm to study **epistemic extrapolation**: the capacity to infer a structured model of another person's knowledge from limited evidence.



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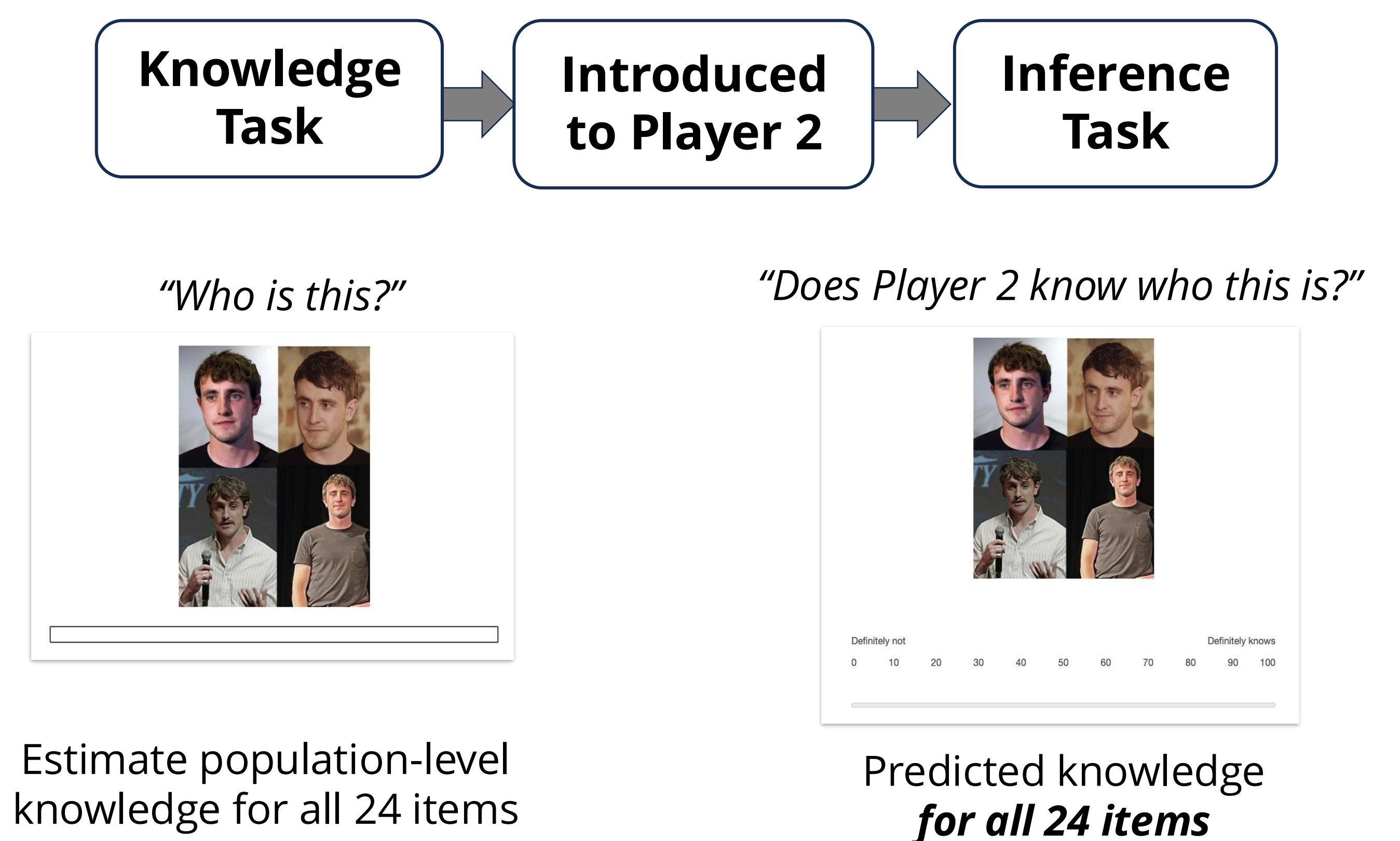
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Stimuli

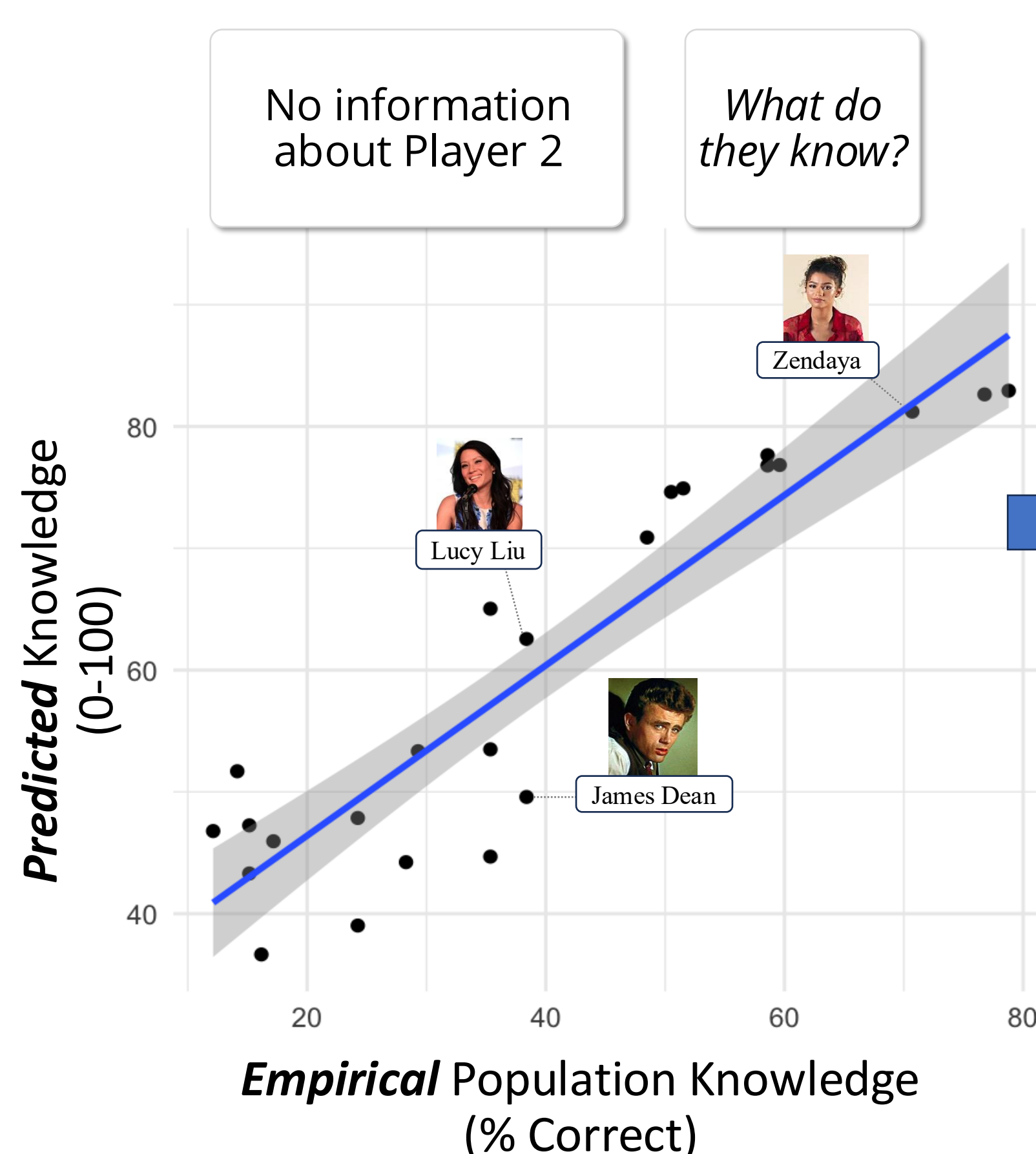


Paradigm



Prior Knowledge Expectations

(n = 100)

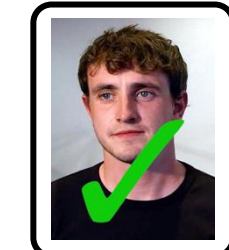


Observe Evidence of P2's knowledge



[10 trial types]
Now, what **else** do they know?

Subgroup of participants who **know**:



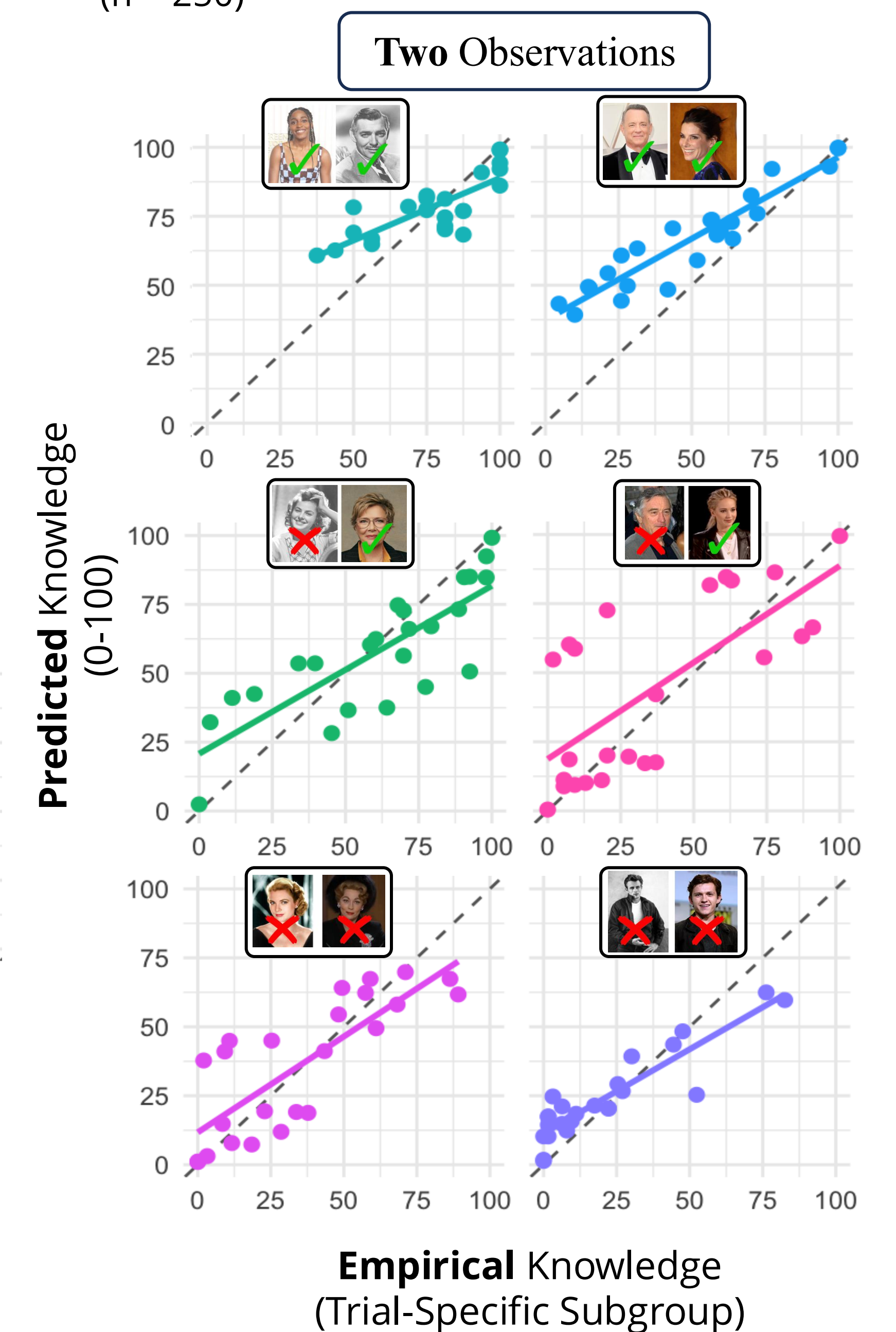
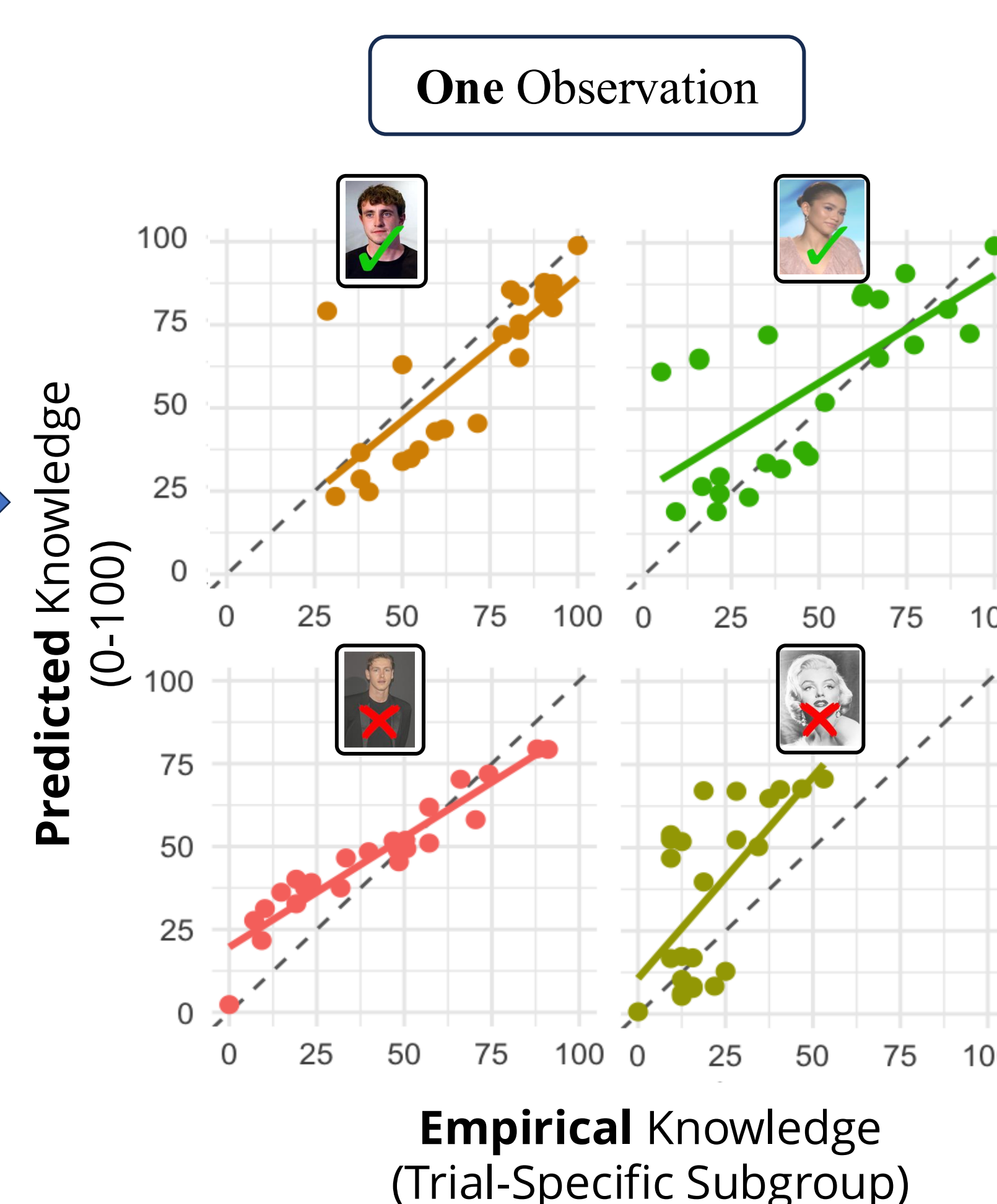
Knowledge of every other item

Trial-Specific Accuracy

For **each** trial type, calculate ground truth accuracy based on the subgroup of participants who match the observed evidence.

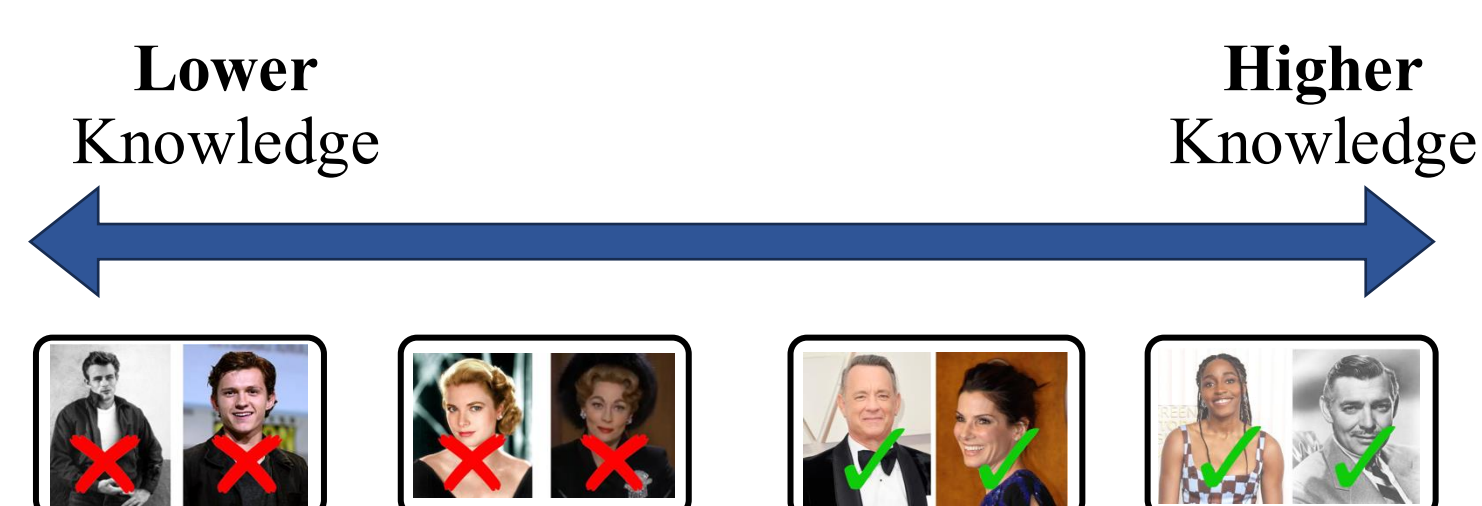
Extrapolating to Unobserved Knowledge

(n = 250)

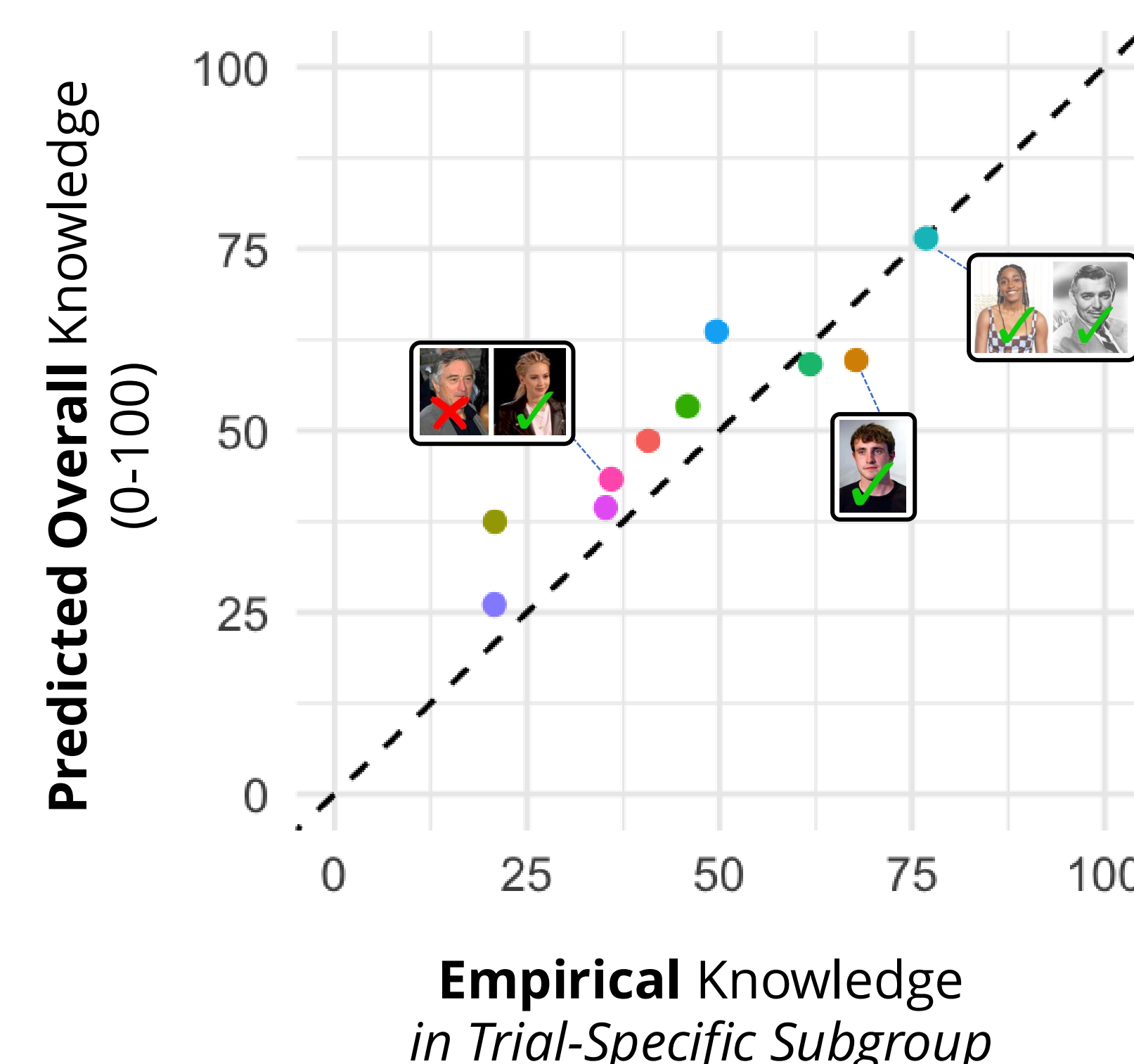


Is **overall** knowledge inferred?

10 trial types (knowledge profiles) were selected to vary in associated ground truth knowledge.



Participants inferences recover that structure.

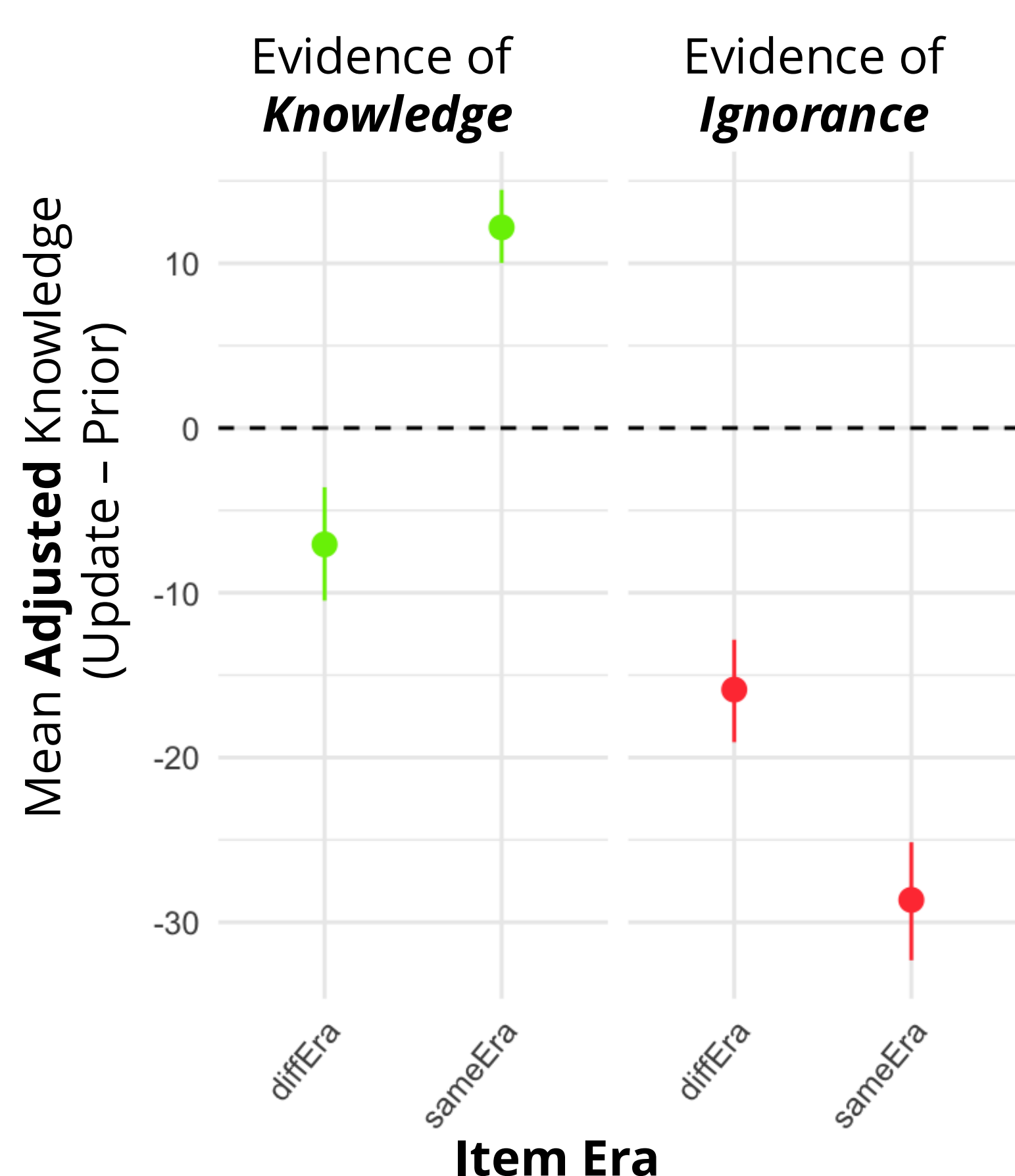
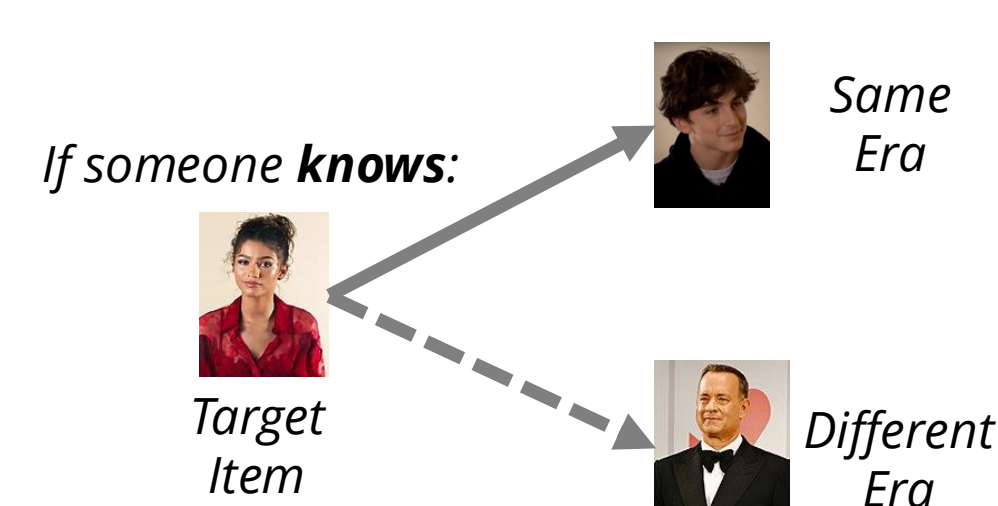


Is updating **structured**?

Items were grouped by era:

Contemporary Hollywood Modern Hollywood Classic Hollywood

Participants **updated more** for related items than unrelated items.

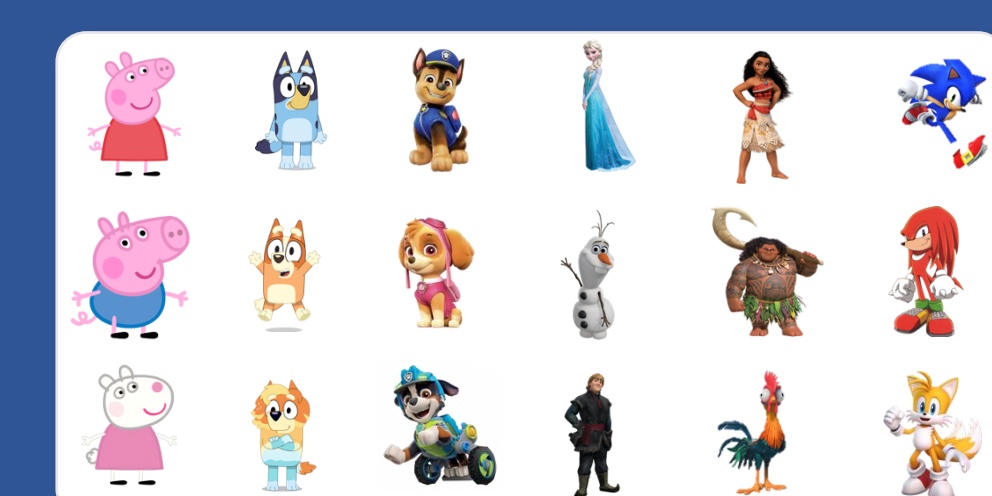


Discussion:

People infer others' knowledge using fine-grained, structured expectations.

Currently replicating these findings in a new domain (geographical knowledge of local neighborhood).

Developmental version: ongoing preregistered studies test children's (ages 4-6) inferences and updating.



Minimal evidence supports fine-grained systematic updated beliefs about others' knowledge.

Scan here for a copy of the poster!

