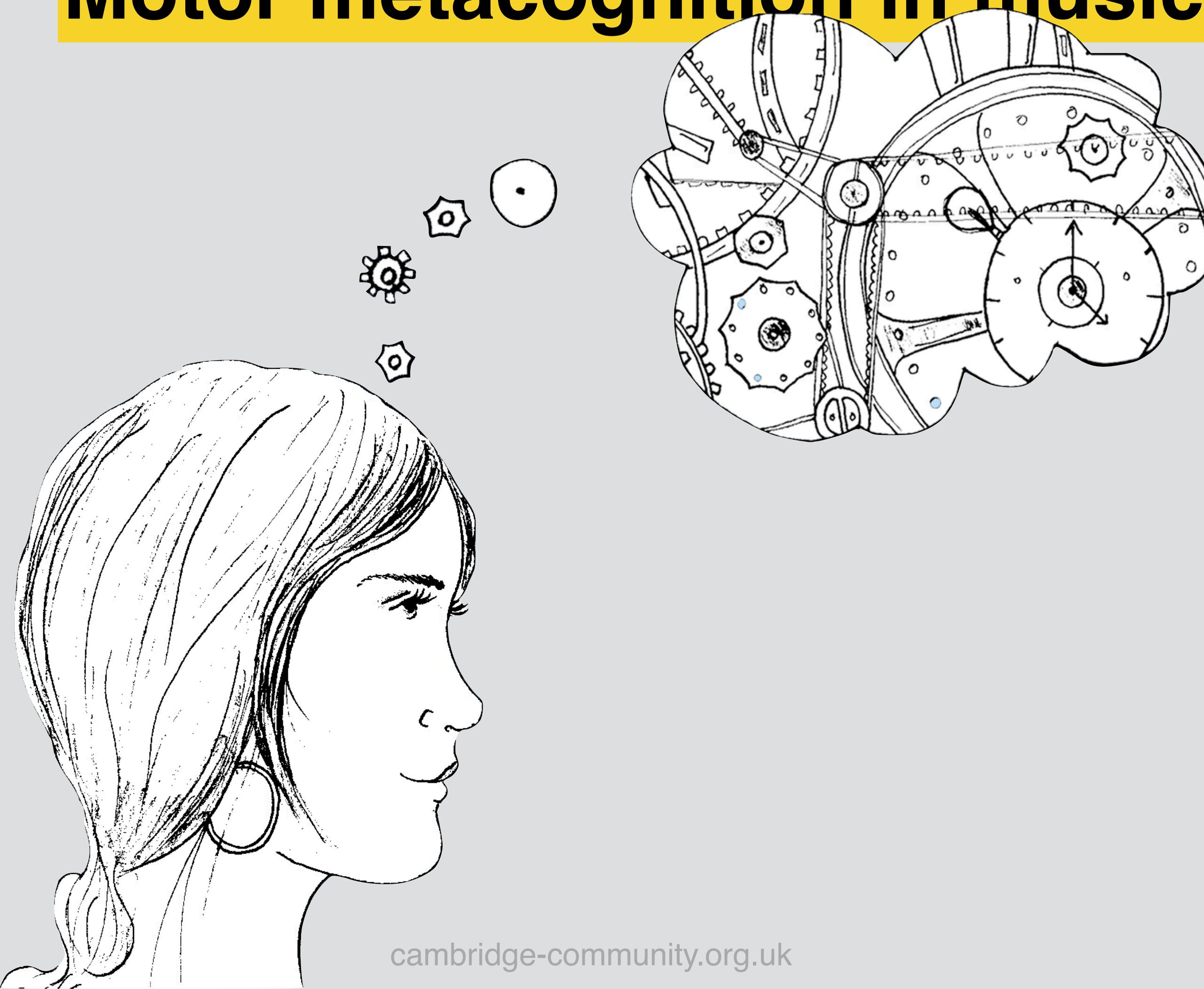


“Come together”

Motor metacognition in music learning



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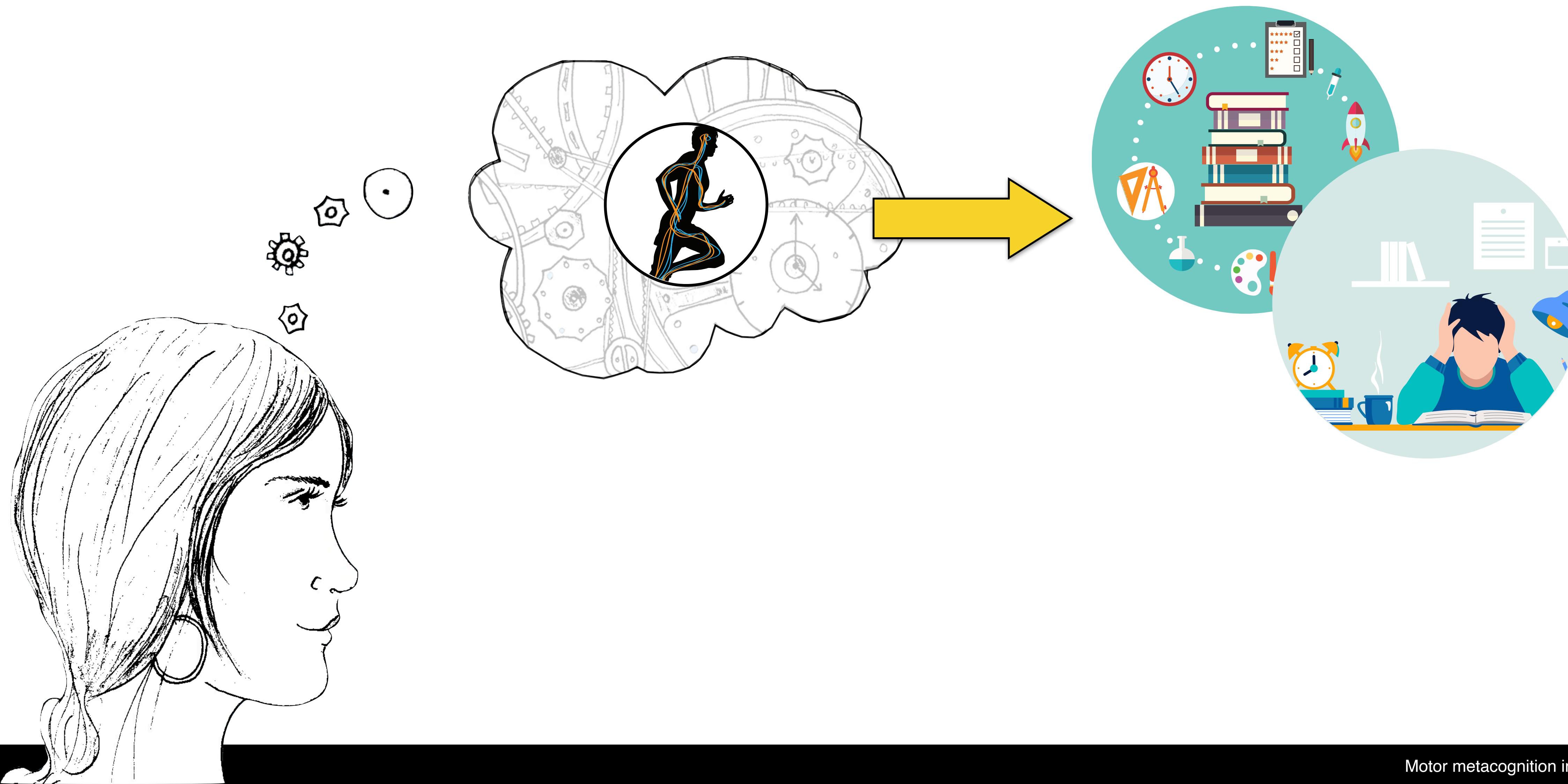
EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



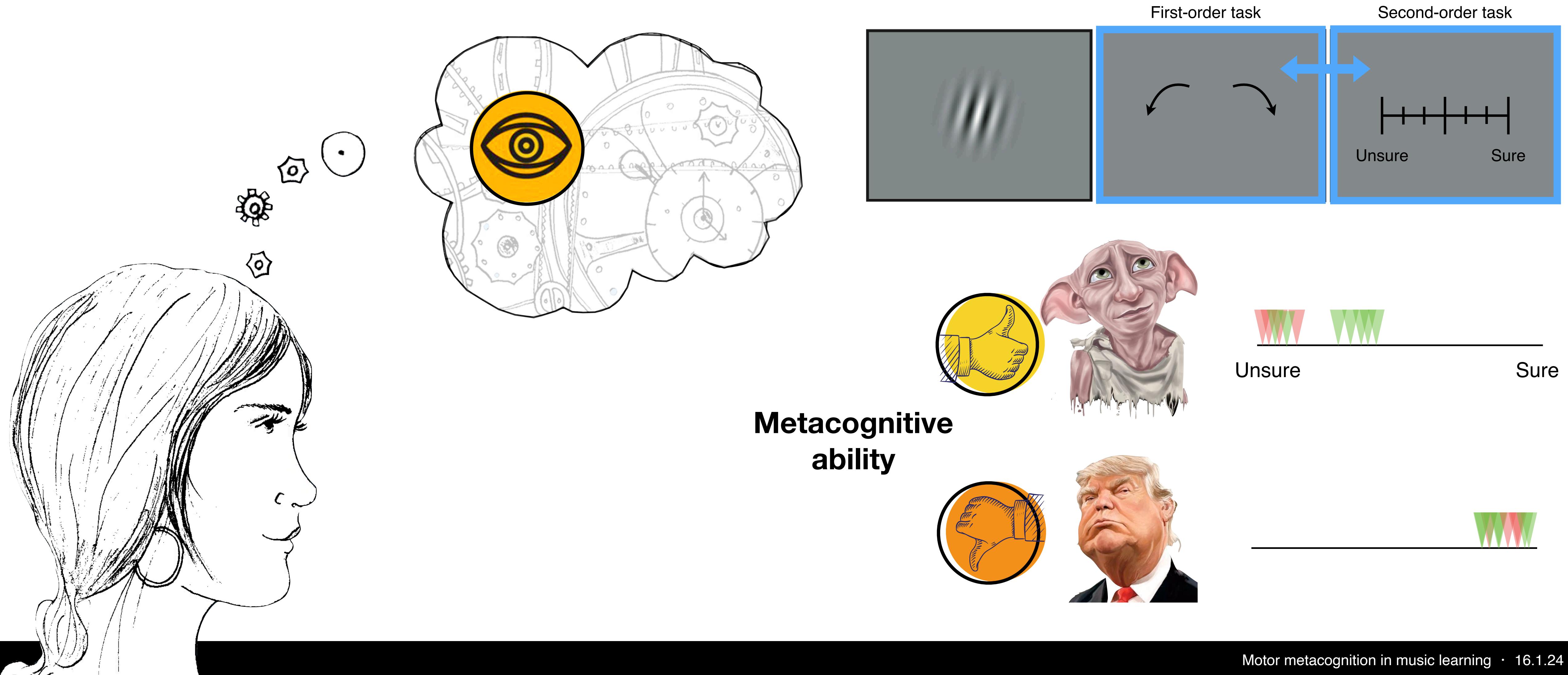
Motor metacognition in music learning



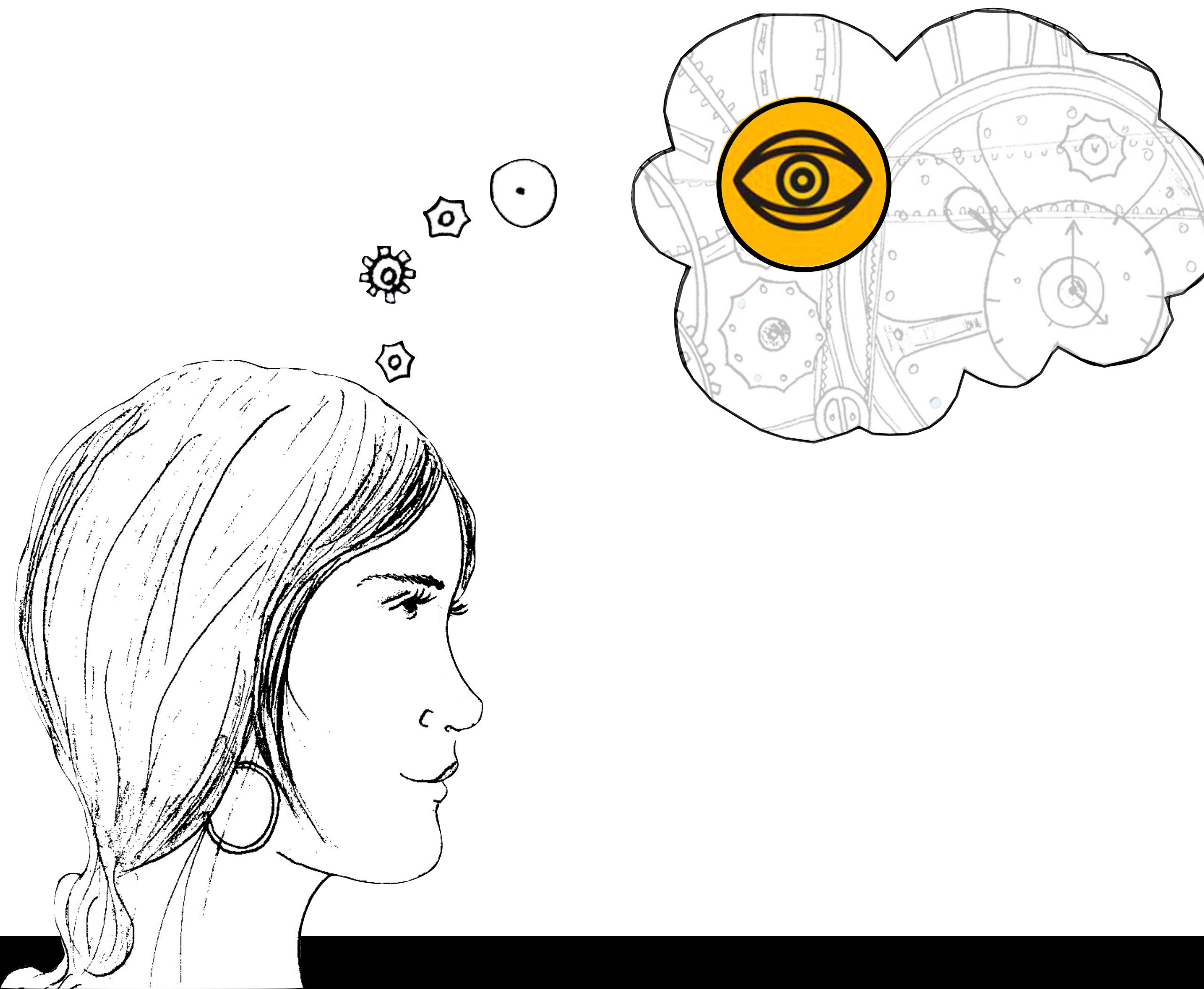
Motor metacognition in music learning



Typical metacognitive task



Typical Practical metacognitive task



“Streetlight effect”



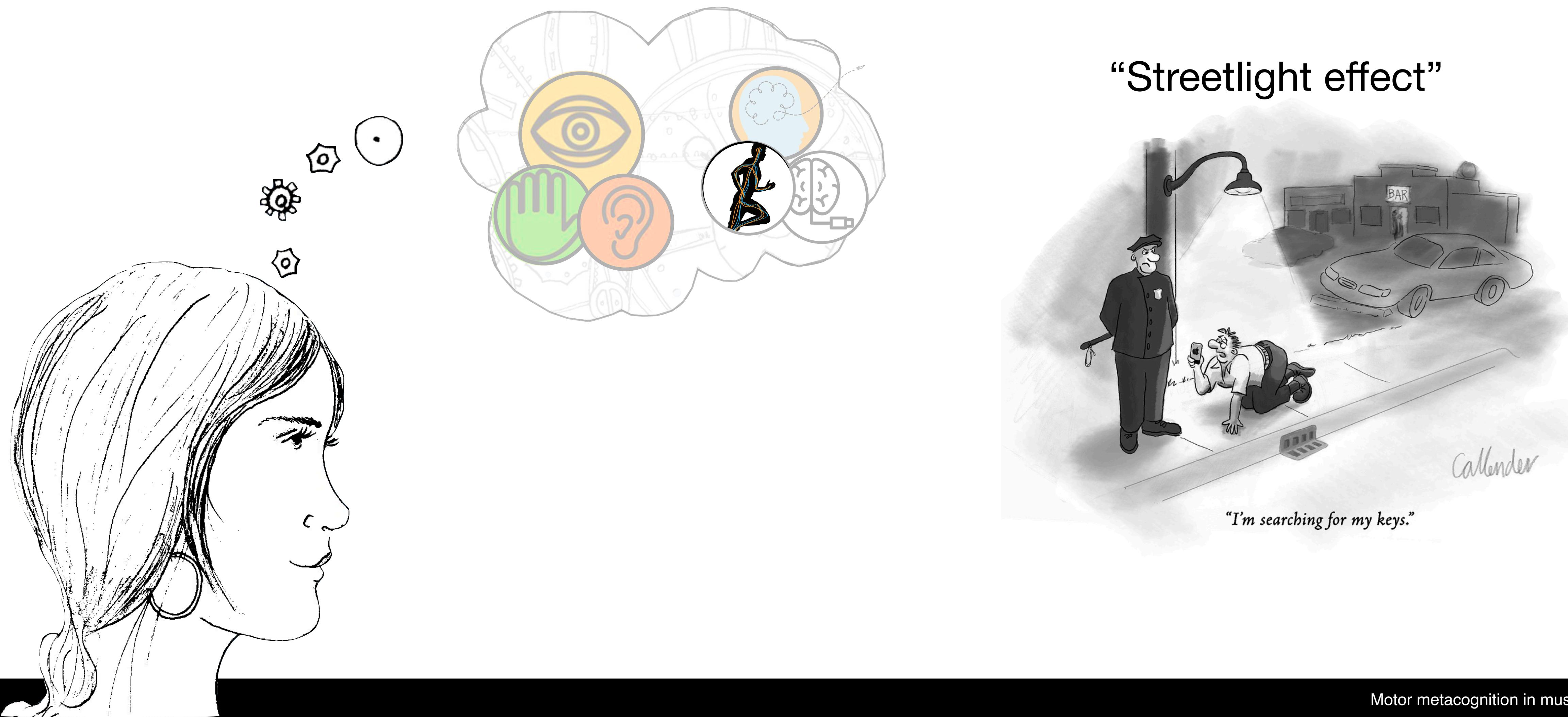
Typical Practical metacognitive task



“Streetlight effect”

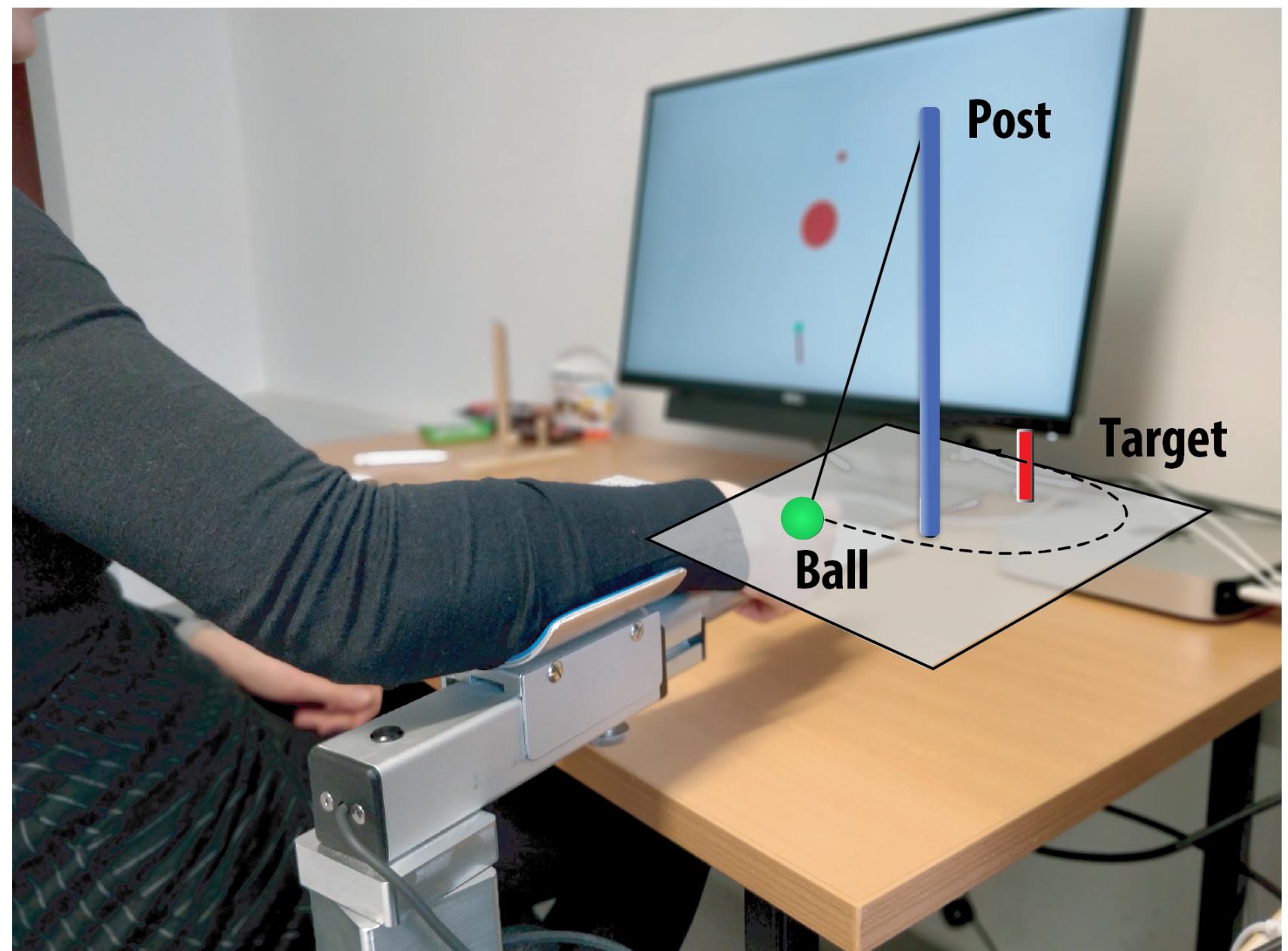


Typical Practical metacognitive task



The Skittles task

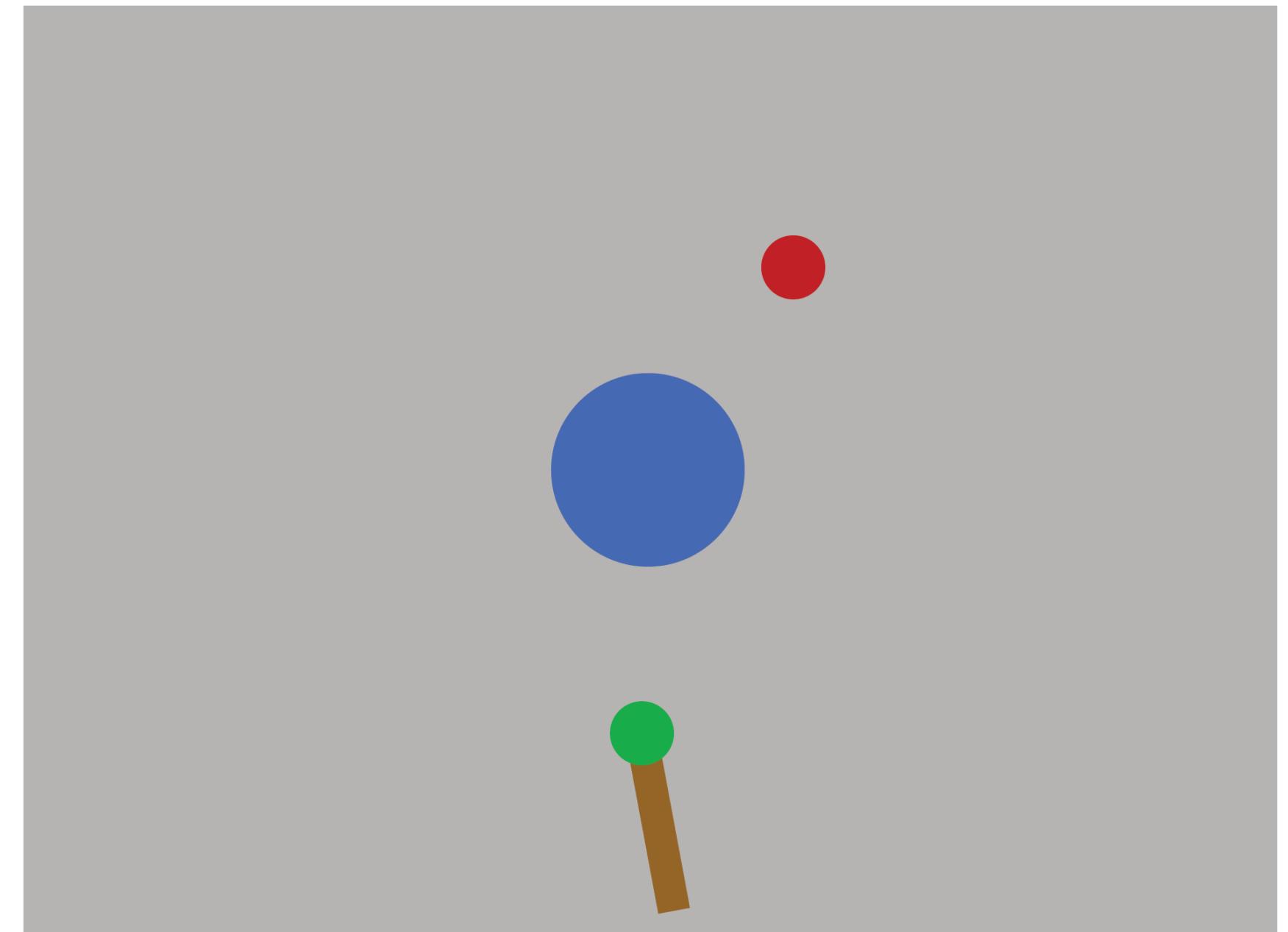
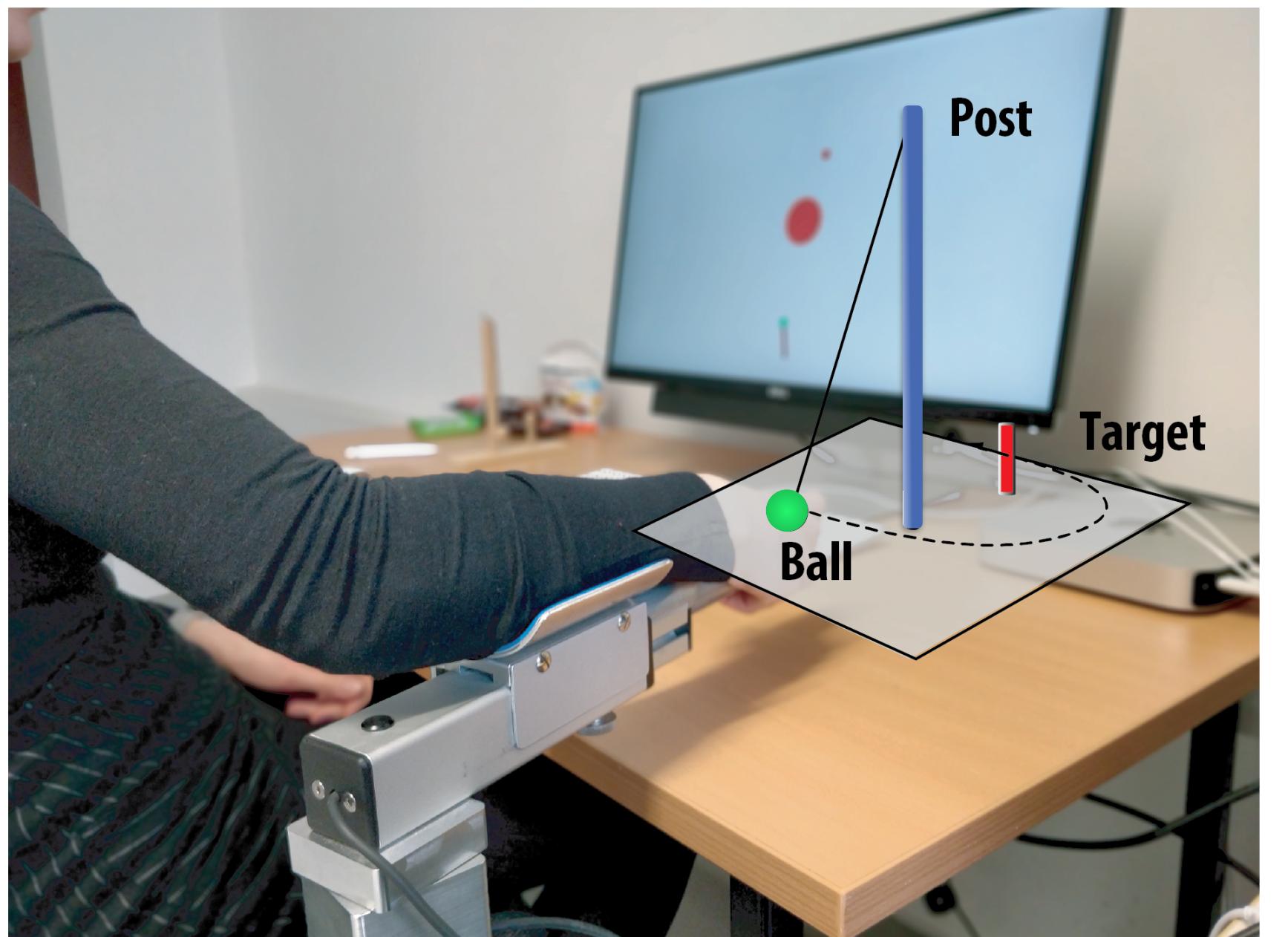
Reducing motor abundance



Müller & Sternad, J Exp Psychol Hum Percept Perform (2004)

The Skittles task

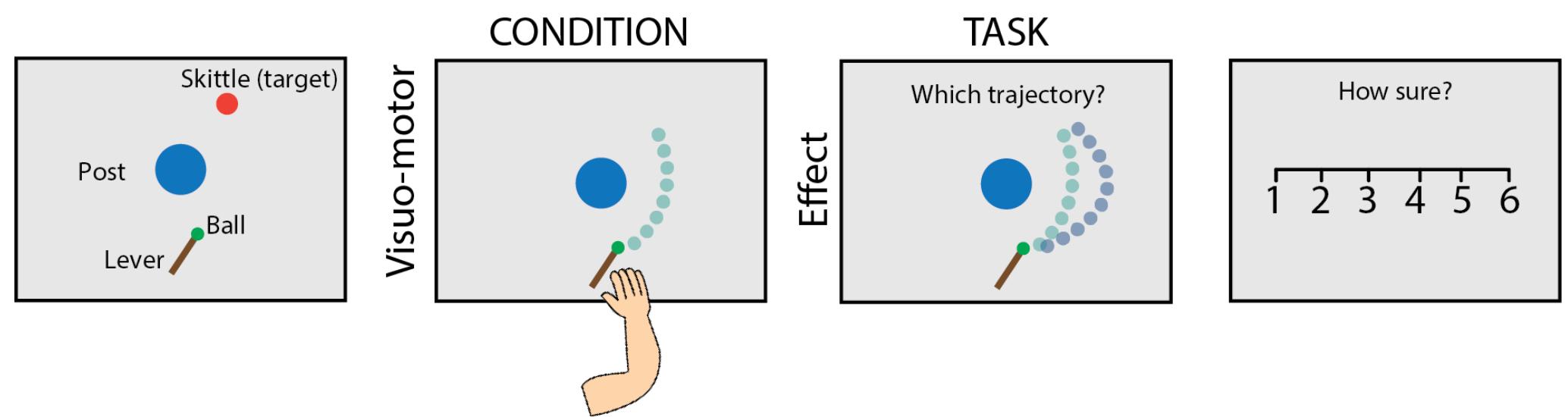
Reducing motor abundance



Müller & Sternad, J Exp Psychol Hum Percept Perform (2004)

Metacognitive task

To measure motor metacognitive ability



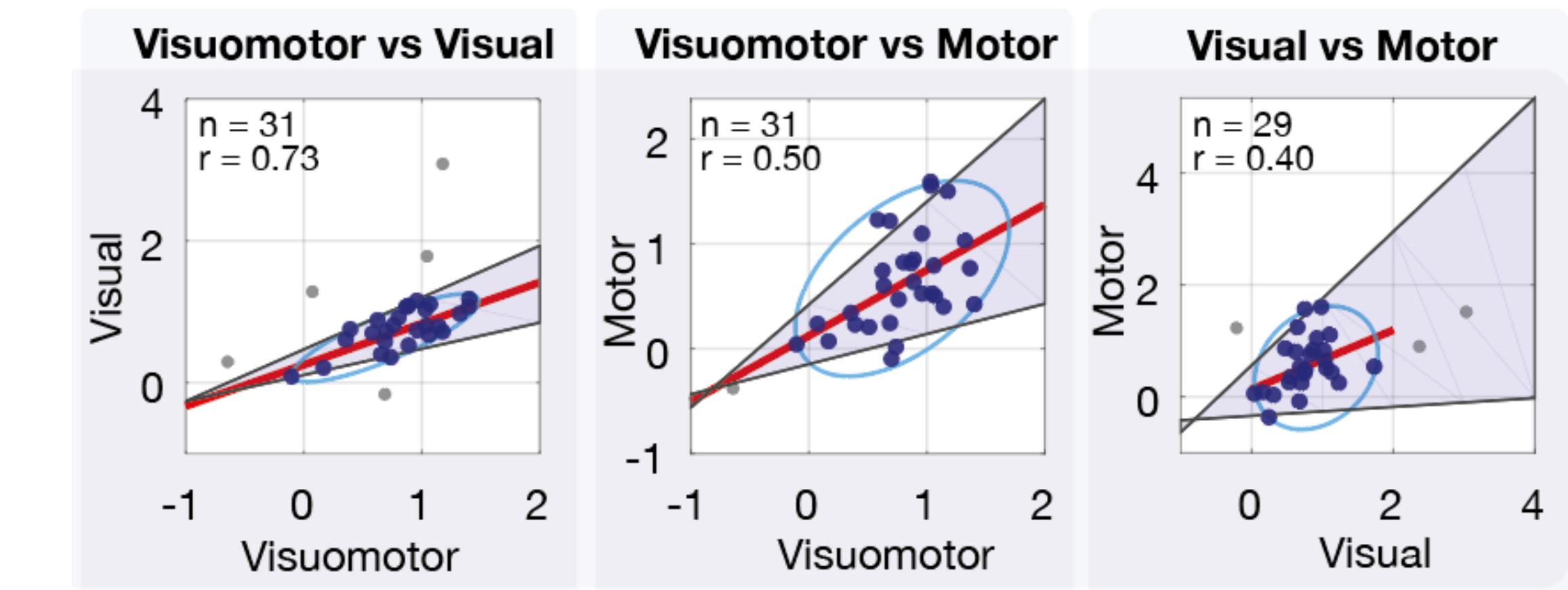
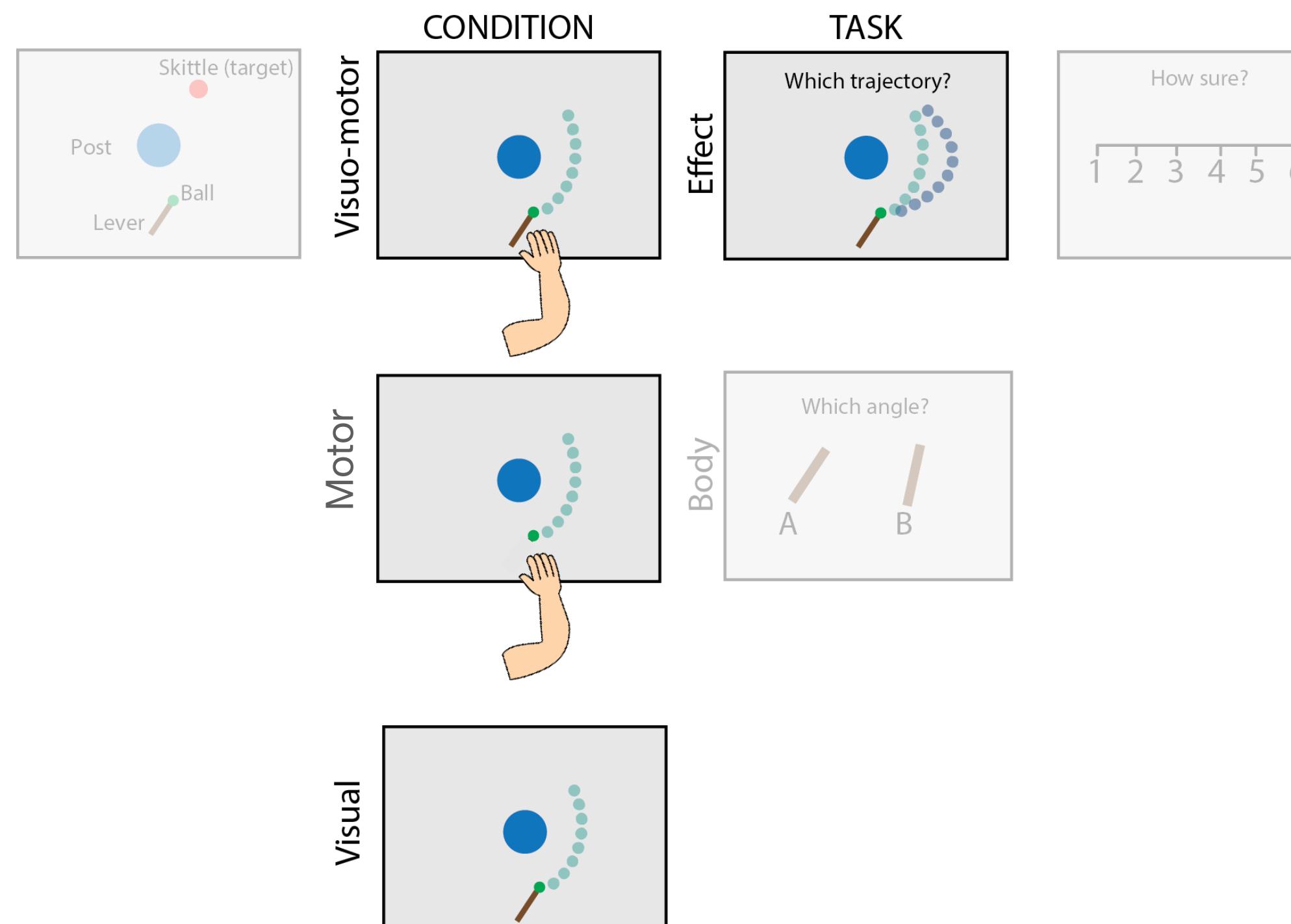
Arbuzova et al, JEP:G (2021)

Polina Arbuzova



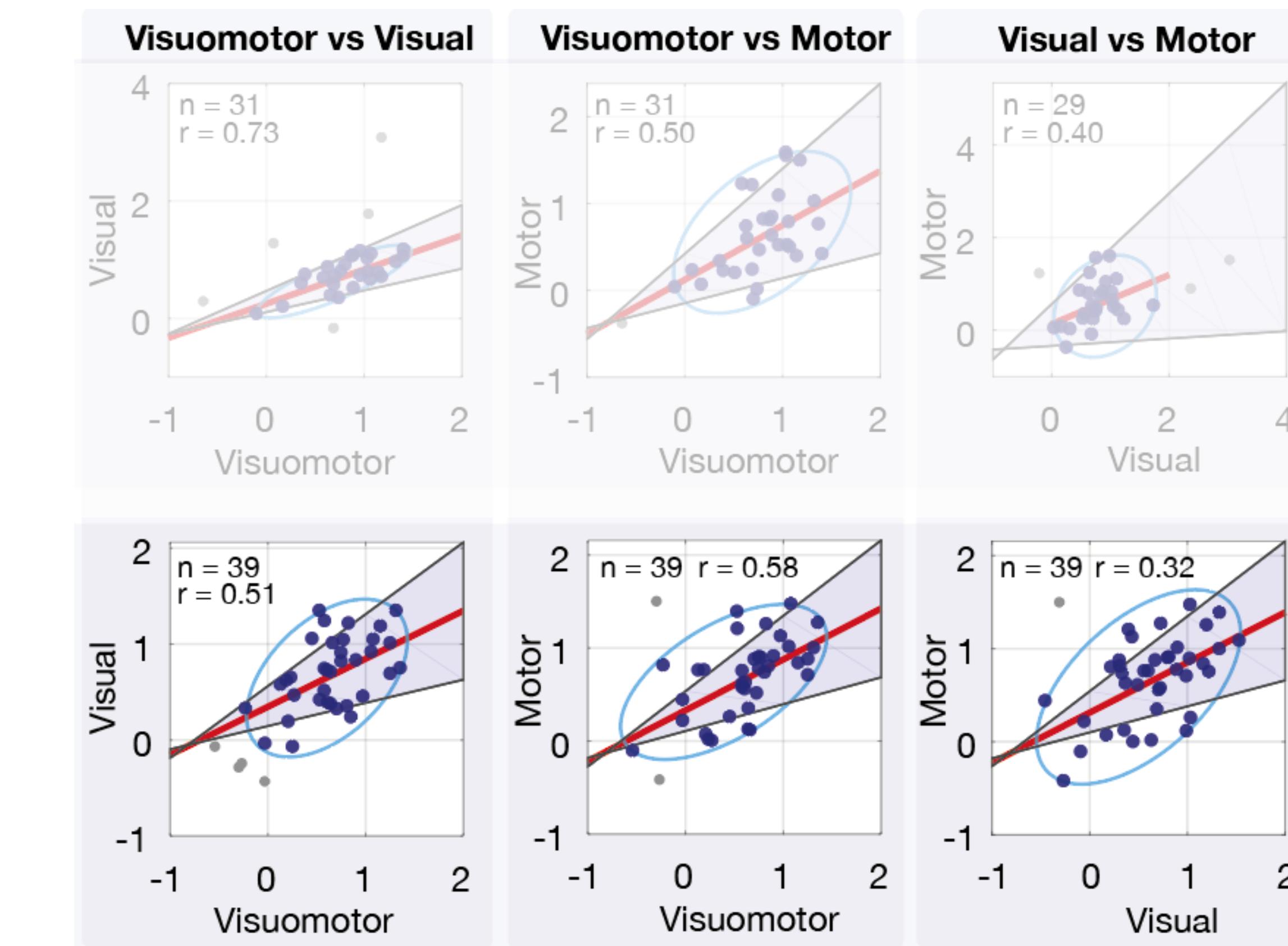
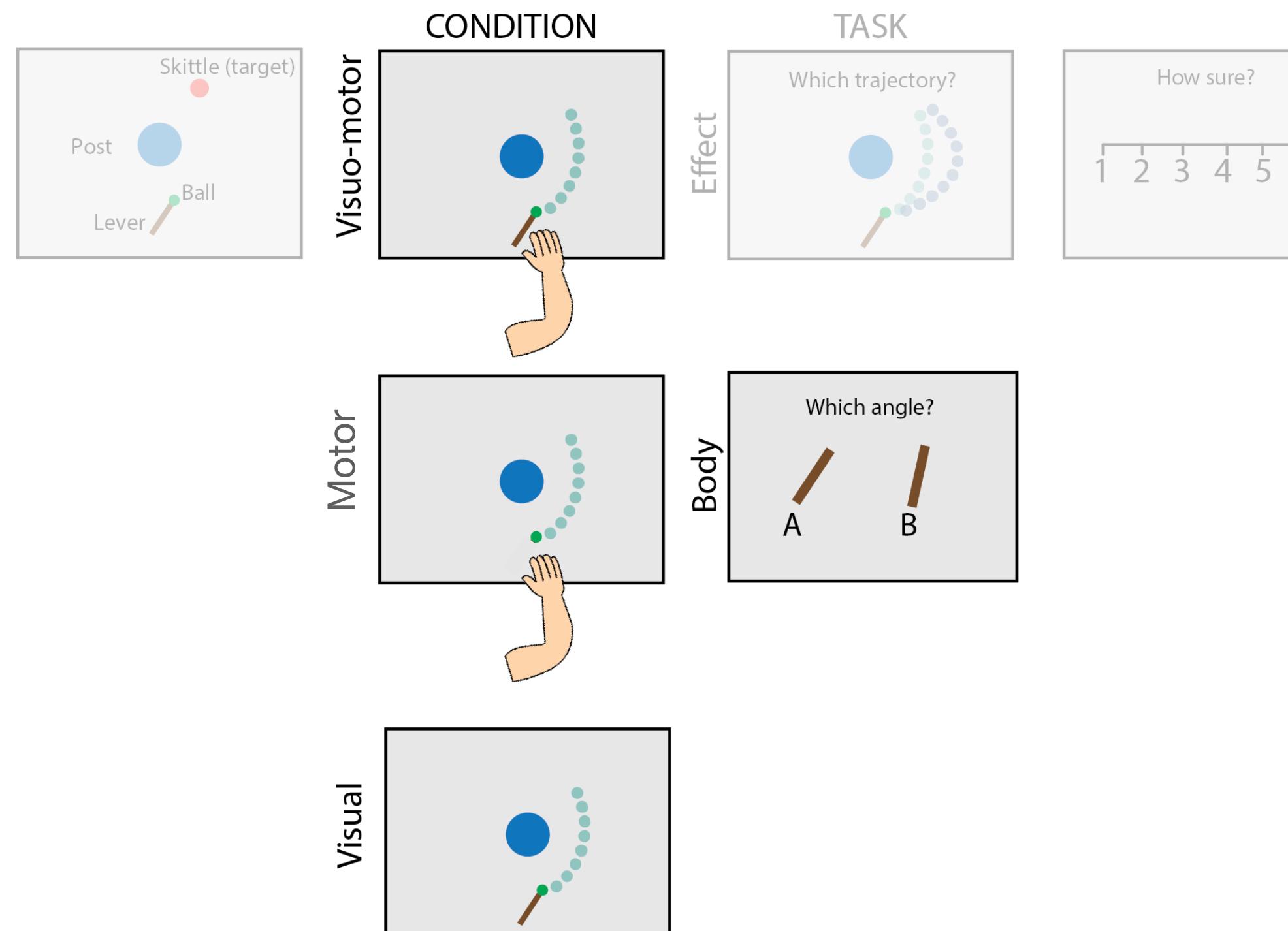
Metacognition in a visuomotor task

Seems “domain-general”



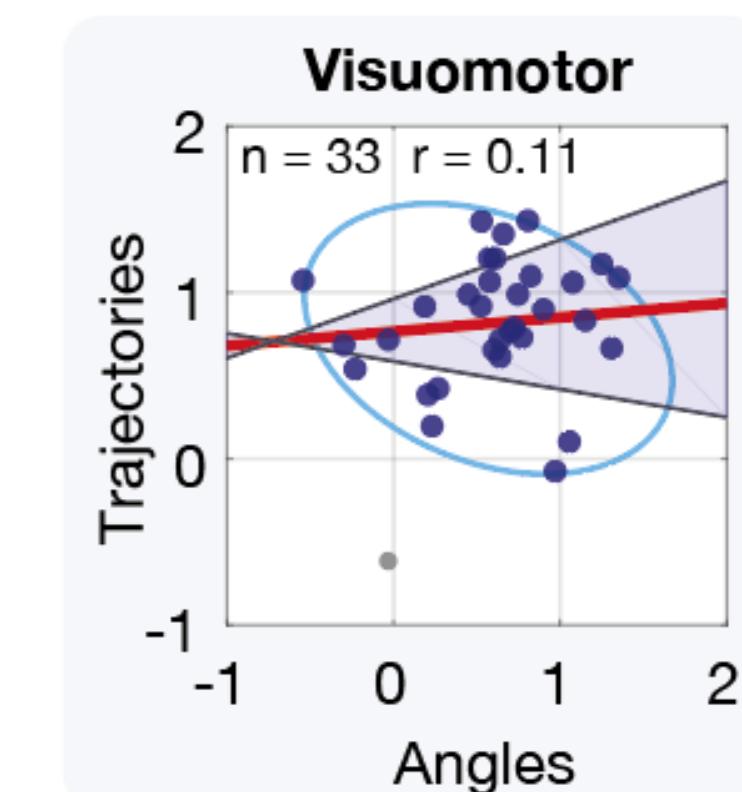
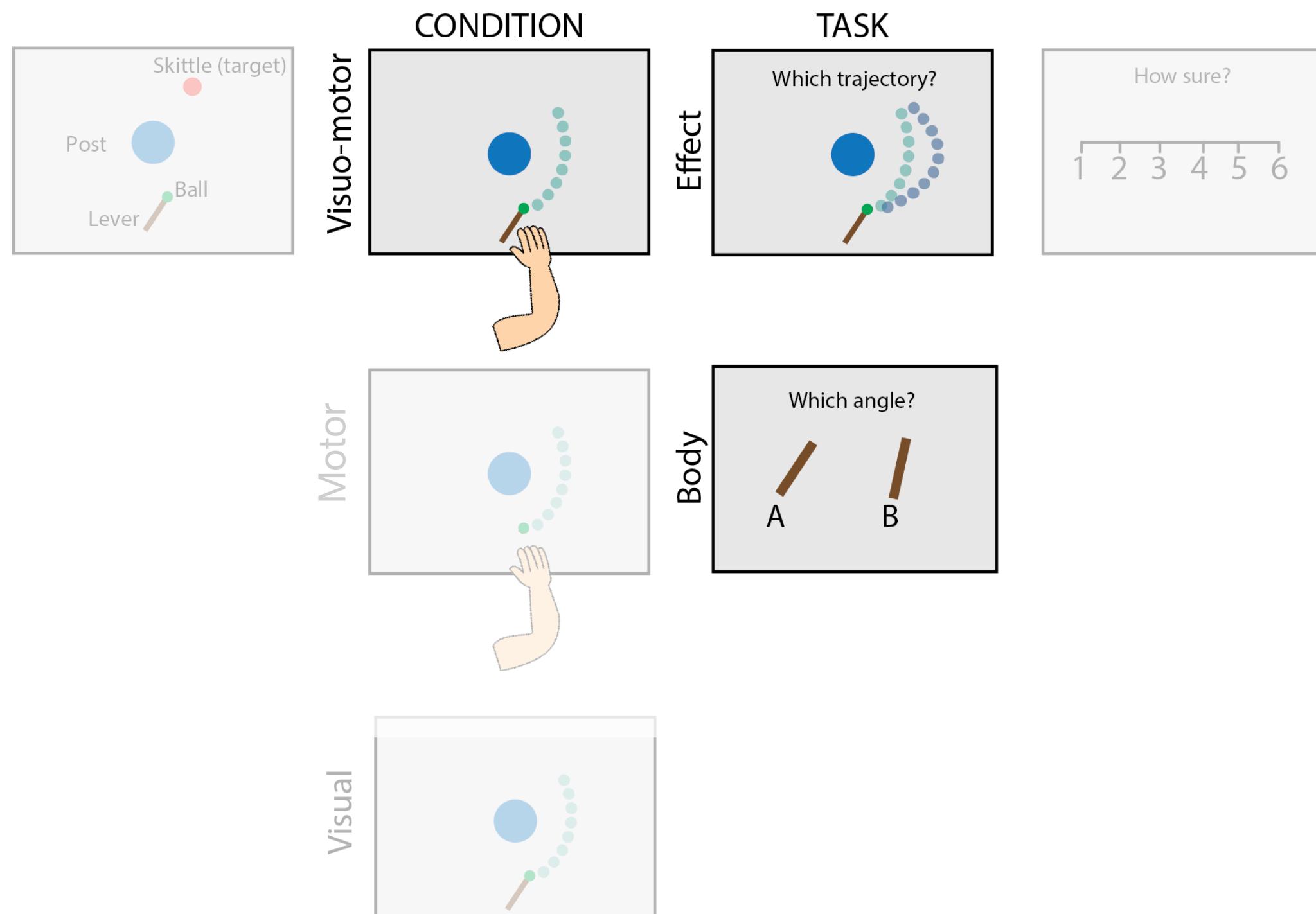
Metacognition in a visuomotor task

Seems “domain-general”



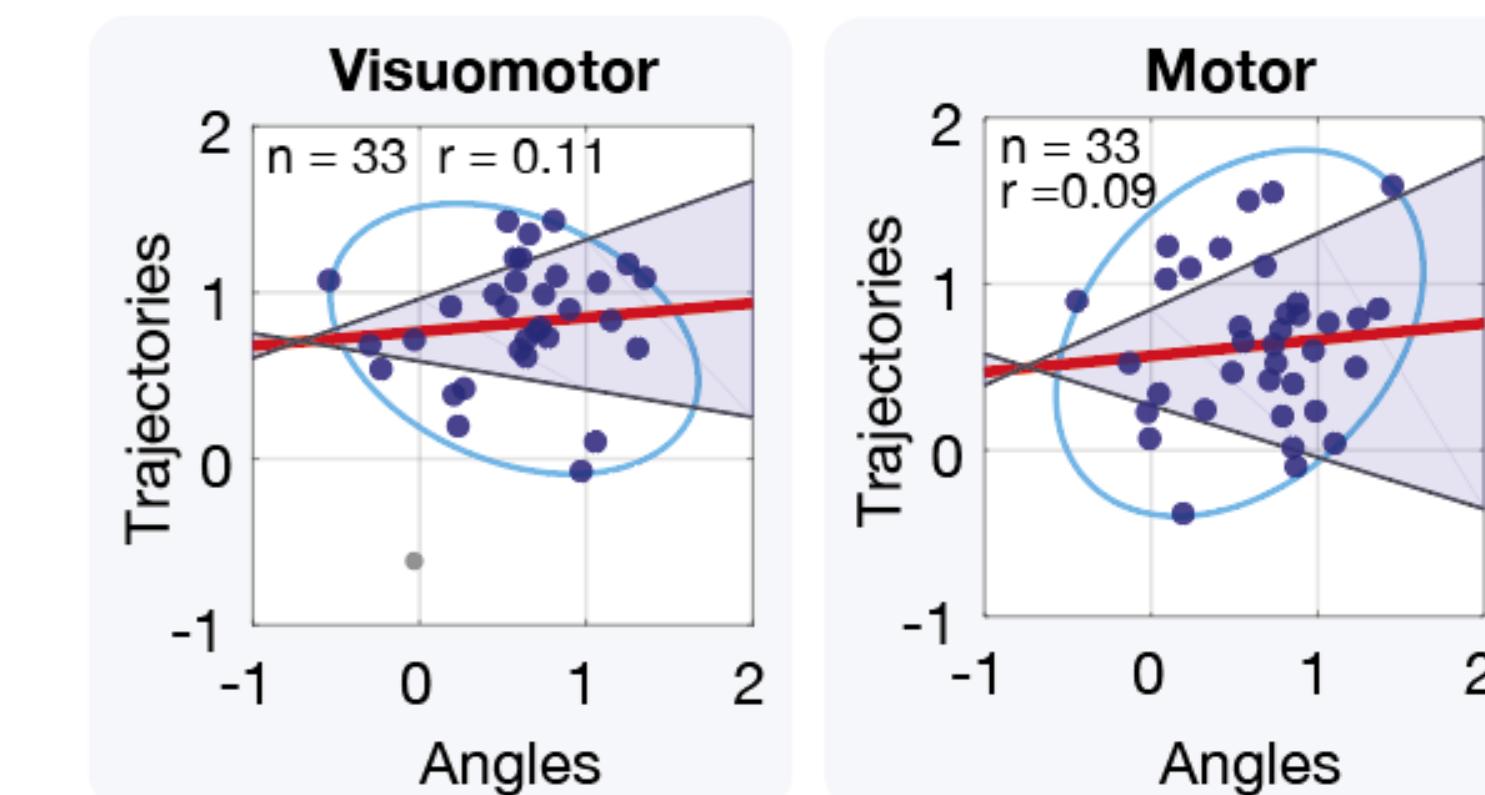
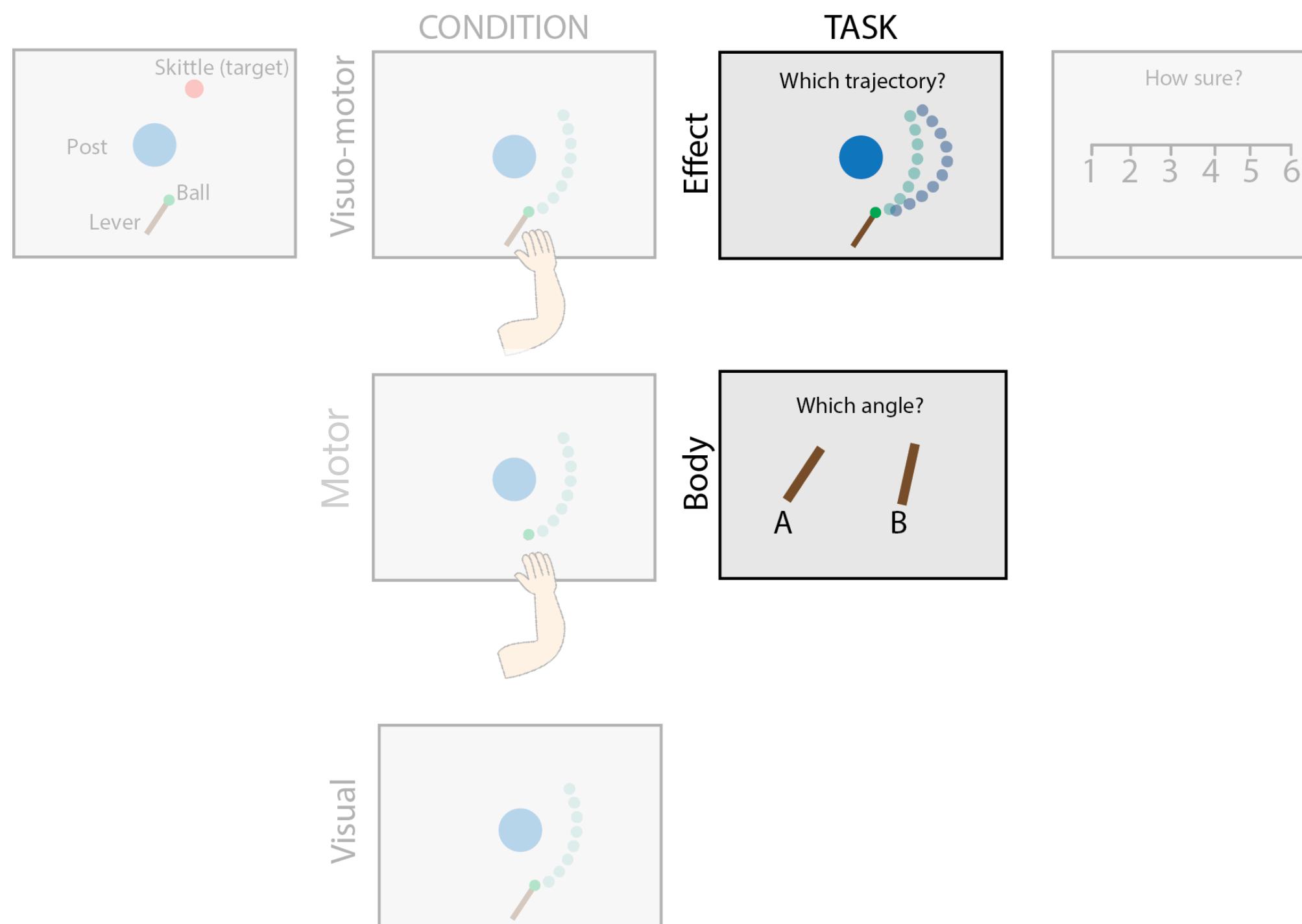
Metacognitive task

But not “task-general”



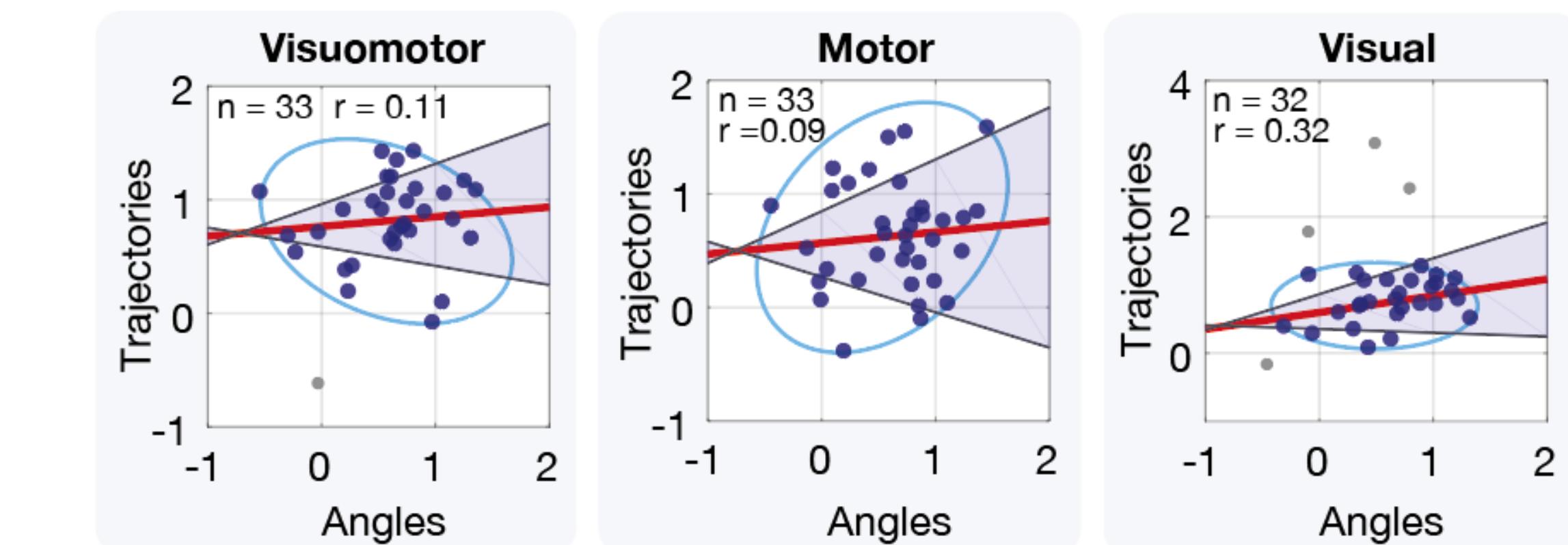
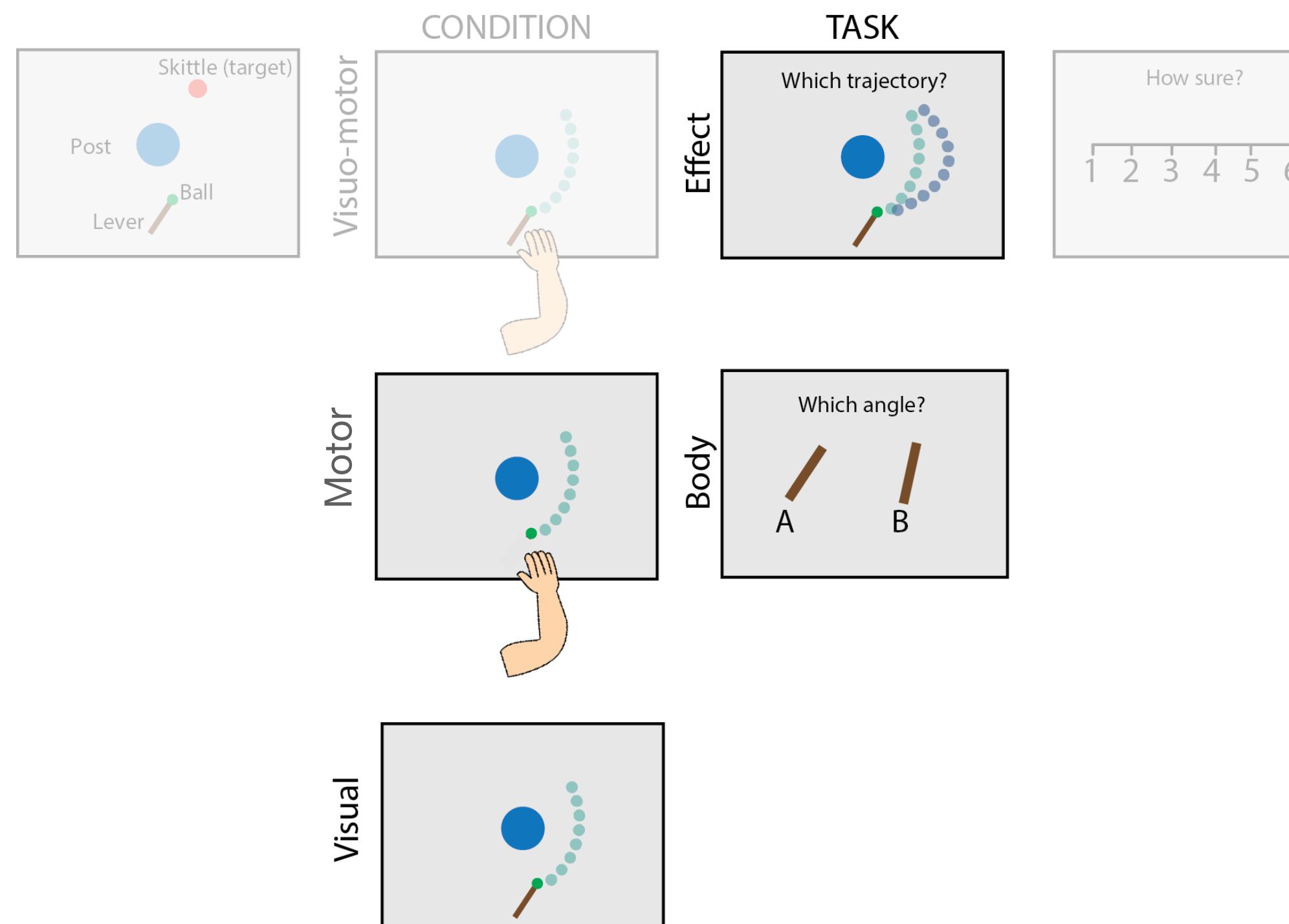
Metacognitive task

But not “task-general”



Metacognitive task

But not “task-general”

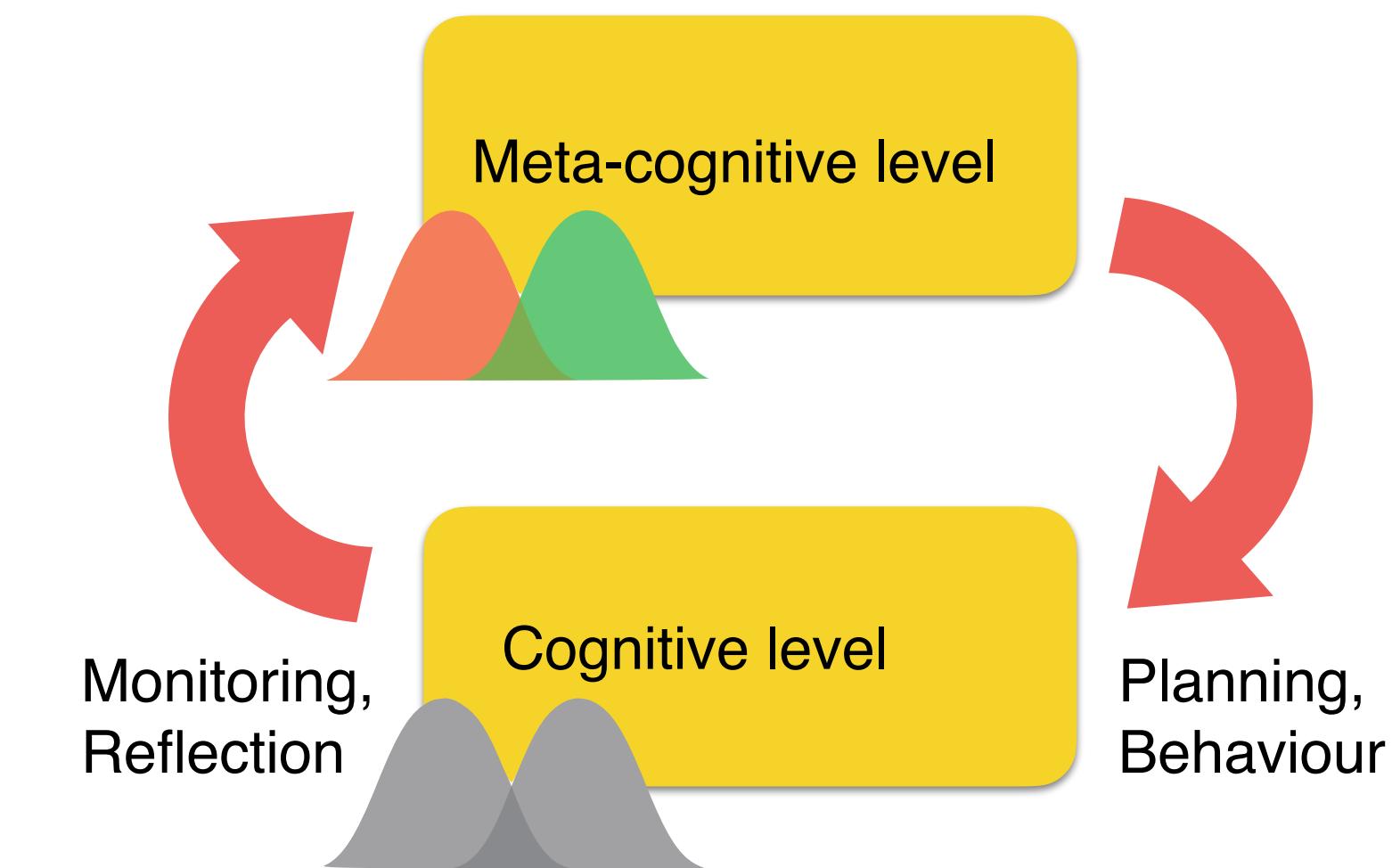
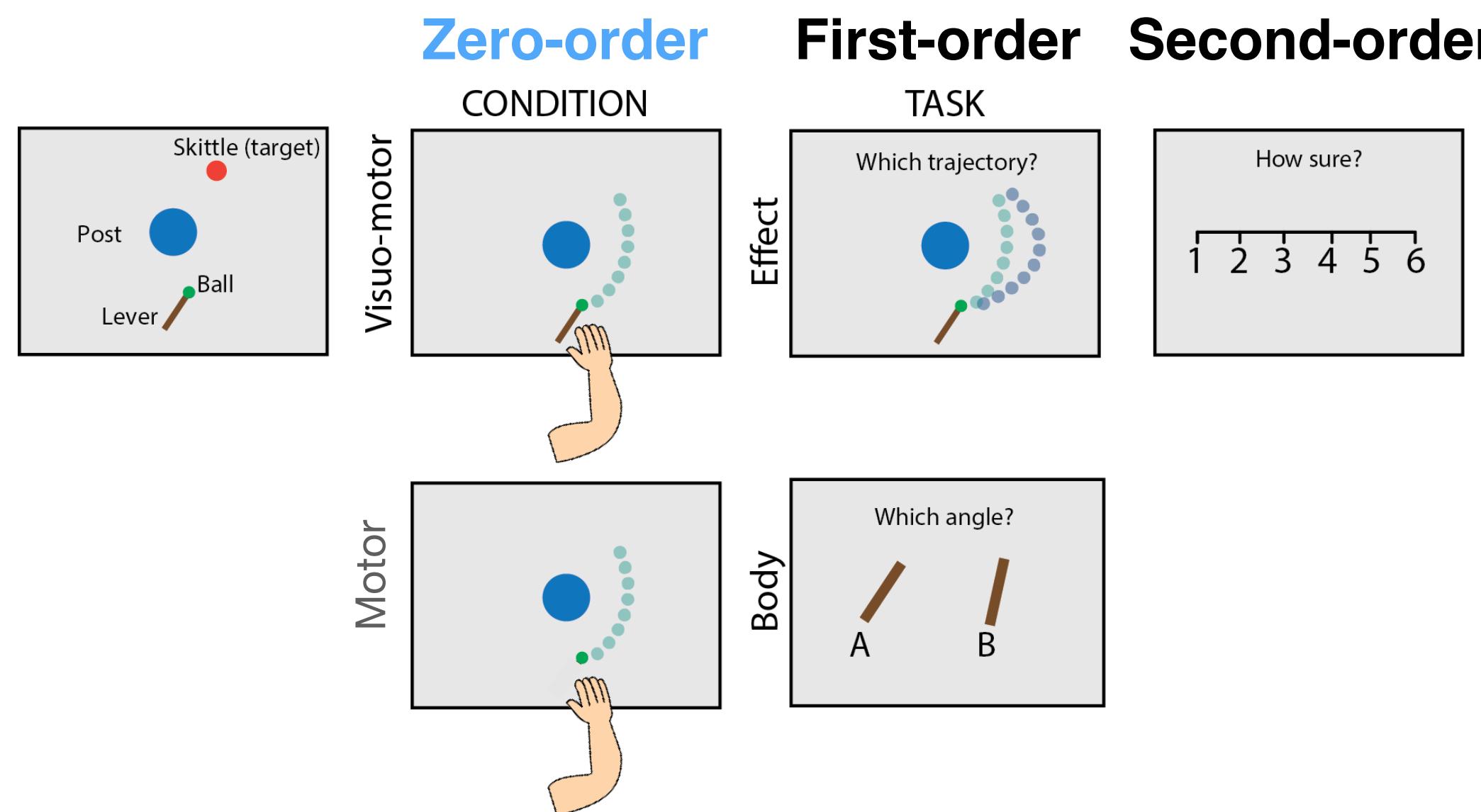


Polina Arbuzova



⇒ The first-order task matters

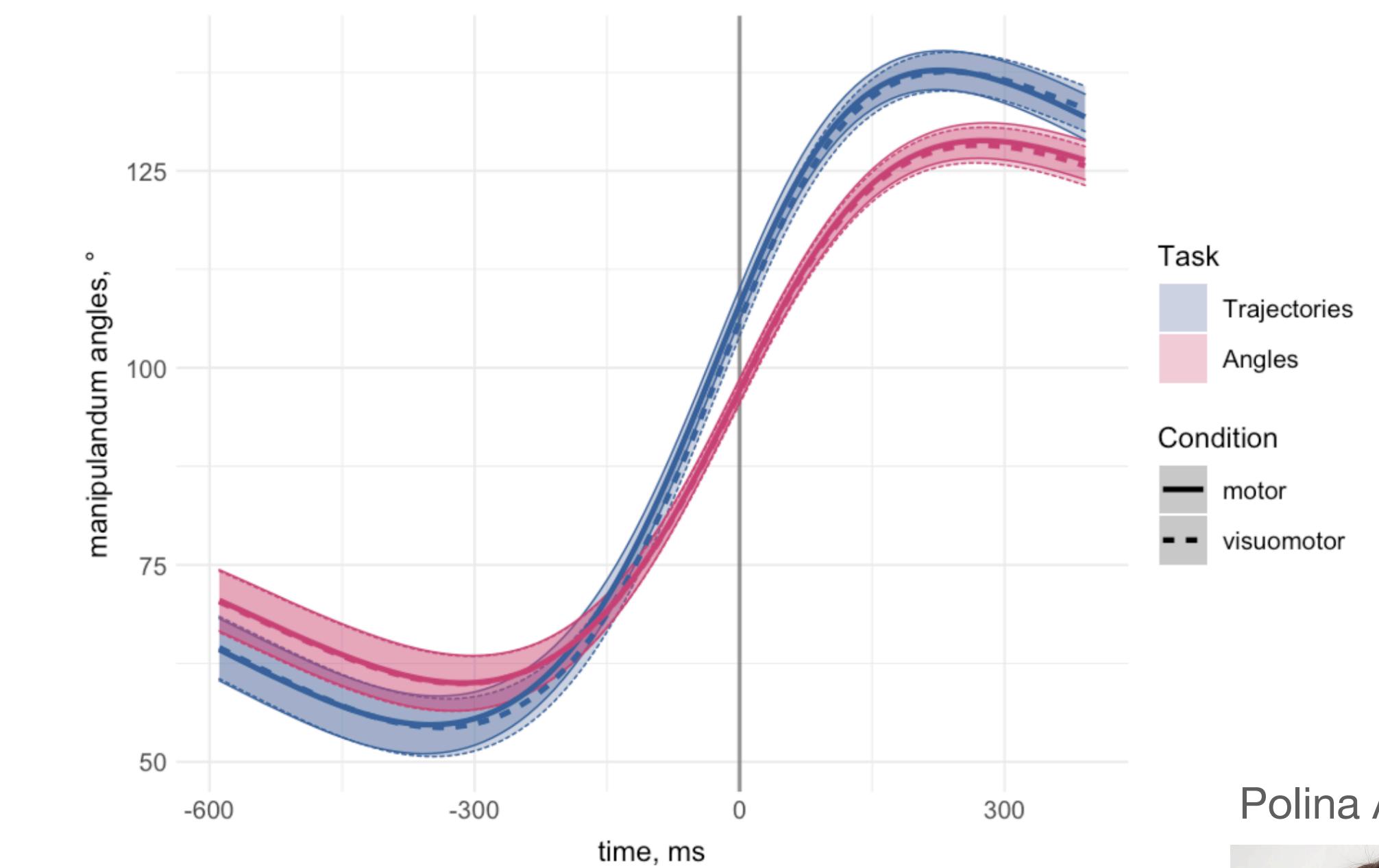
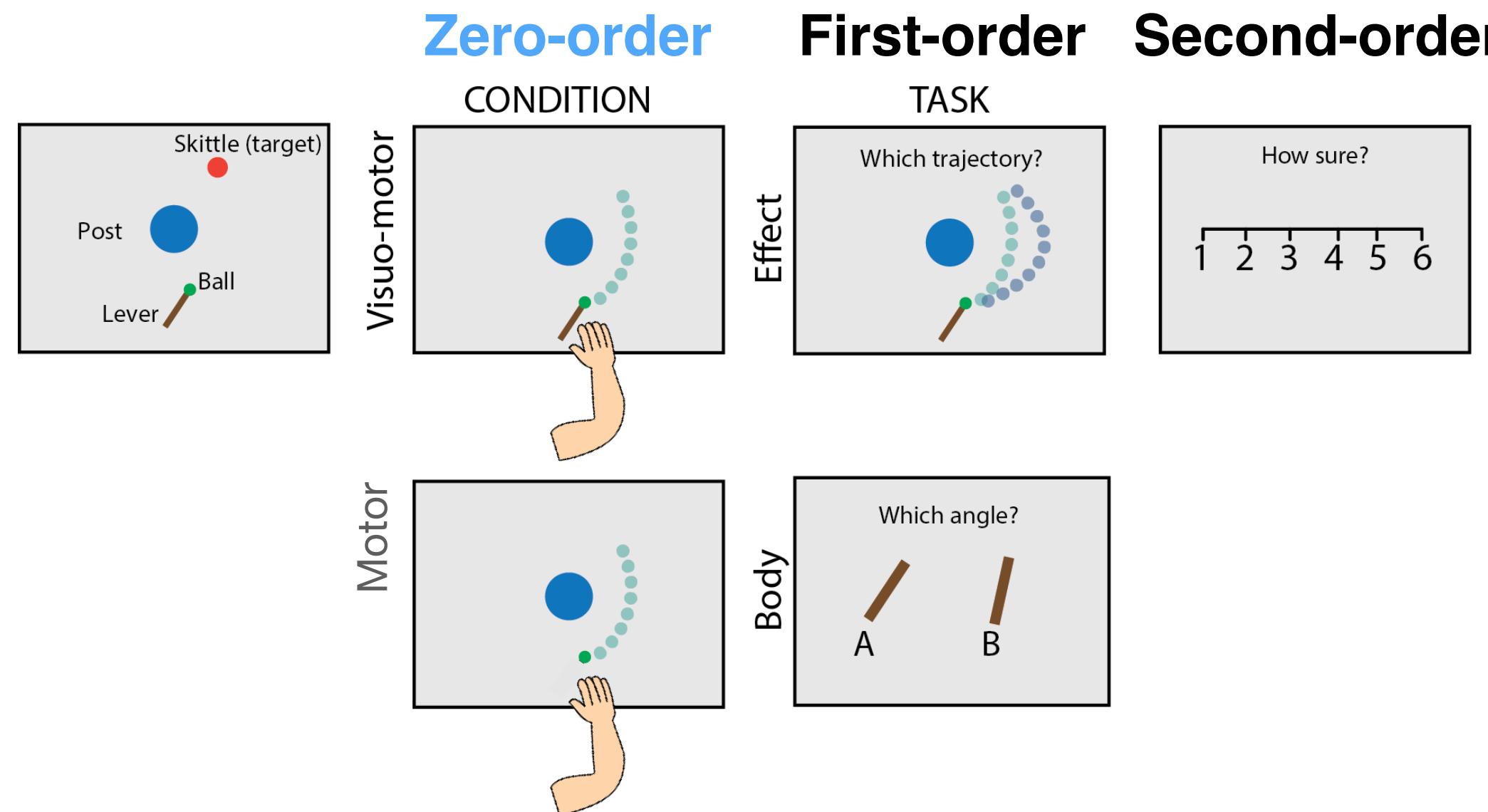
Metacognitive control



Polina Arbuzova



Second-order effects on zero-order behavior

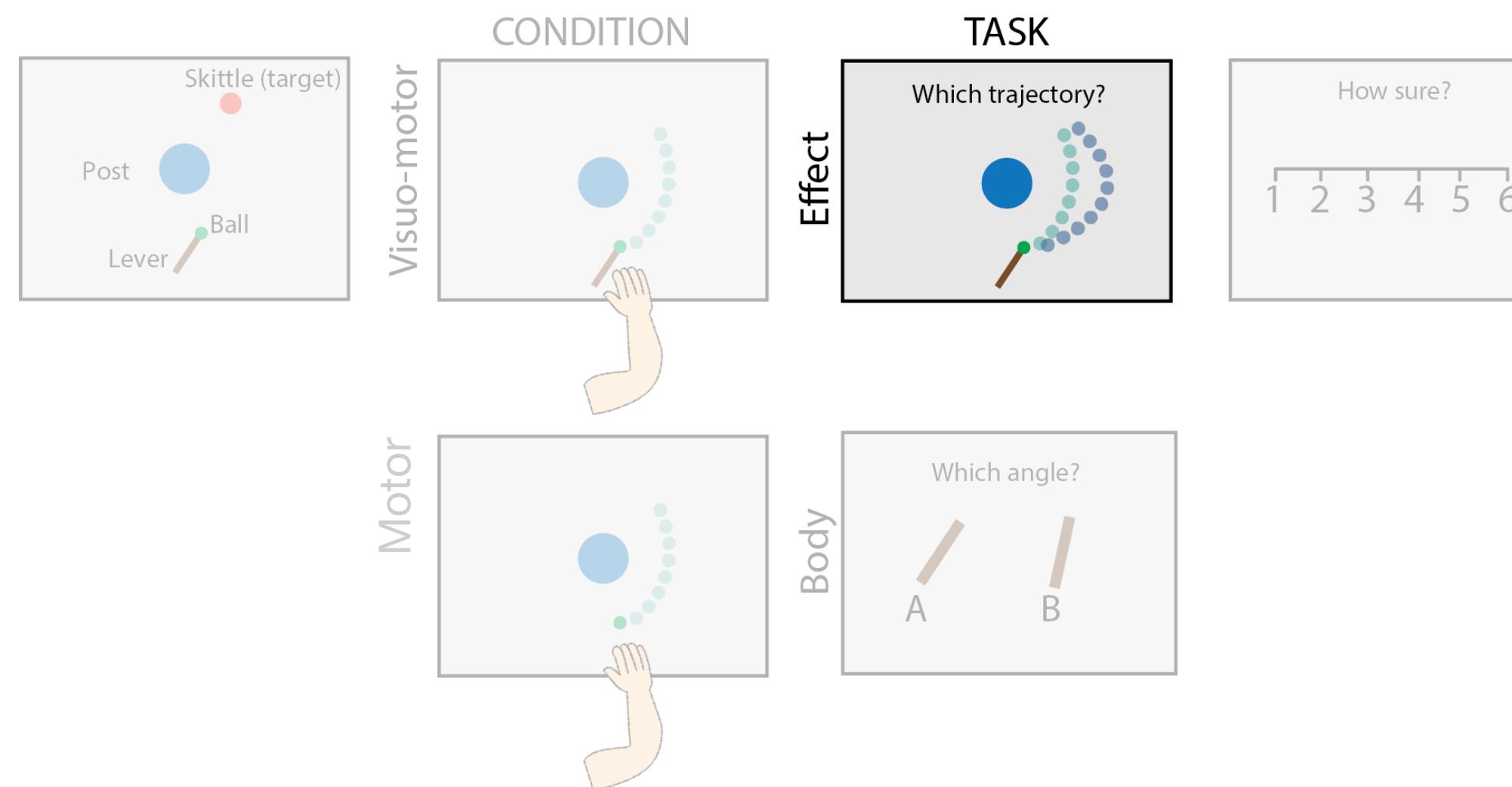


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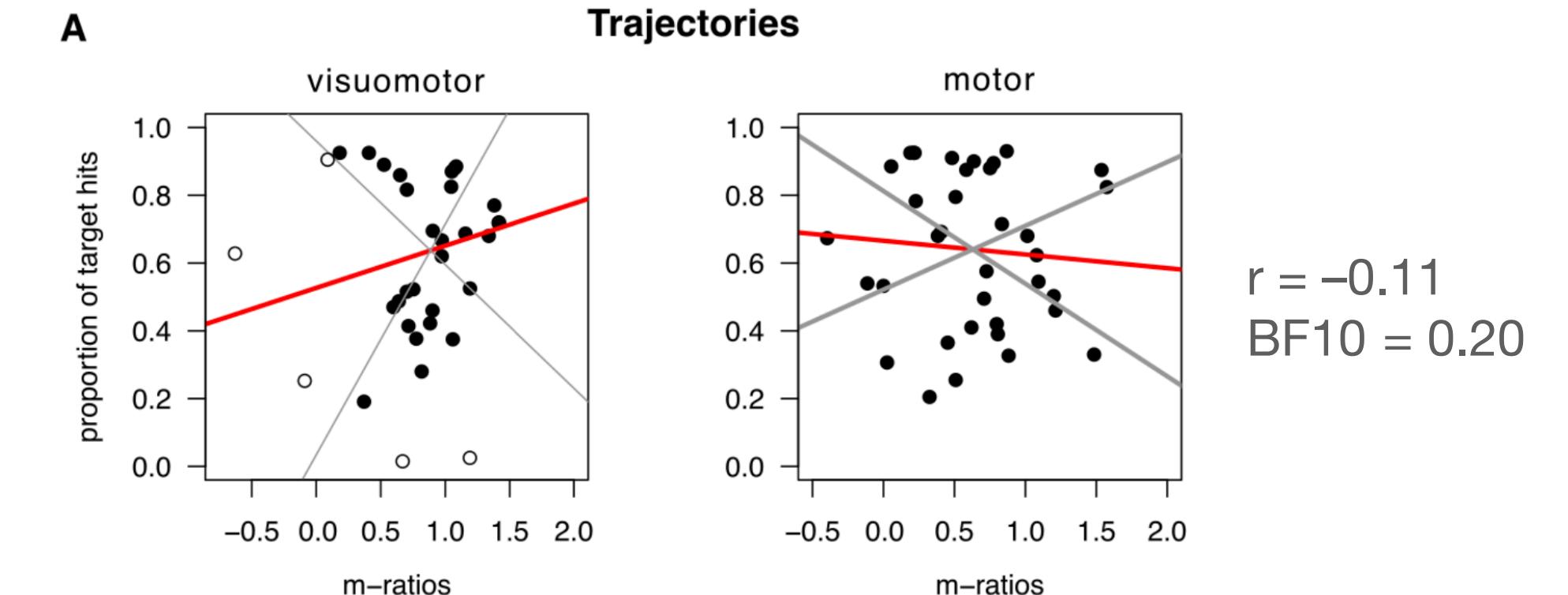


⇒ Participants regulated their movements based on the demands of the metacognitive task.

Metacognitive ability vs. expertise



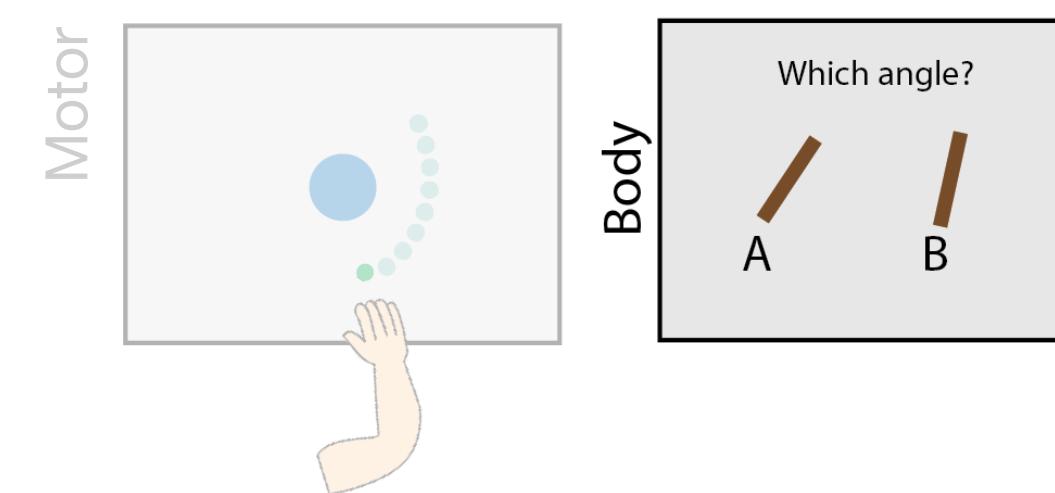
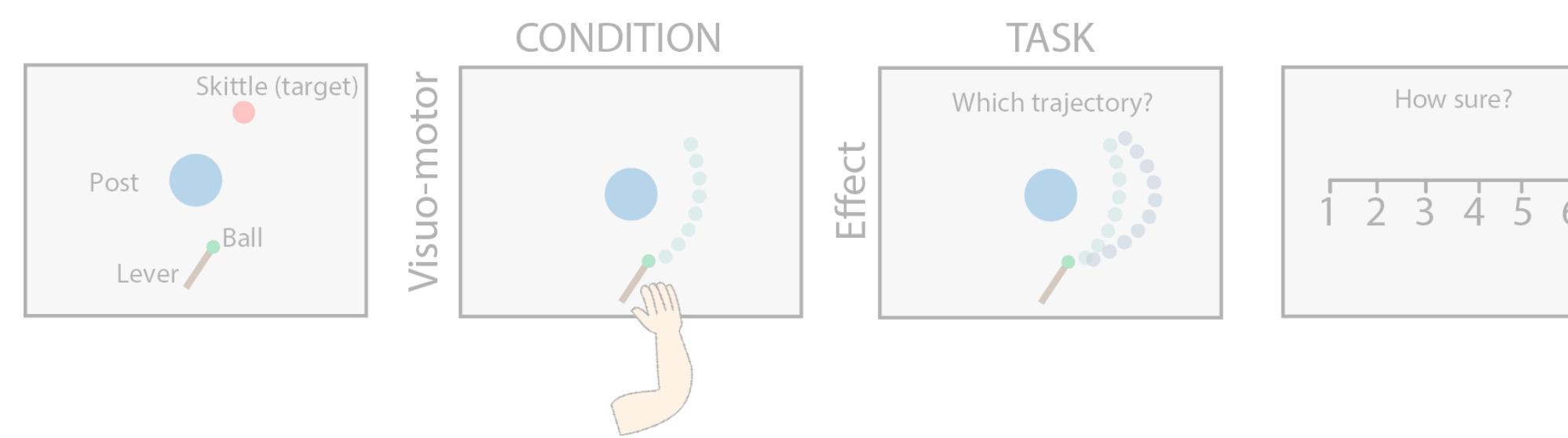
$r = 0.09$
 $BF_{10} = 0.23$



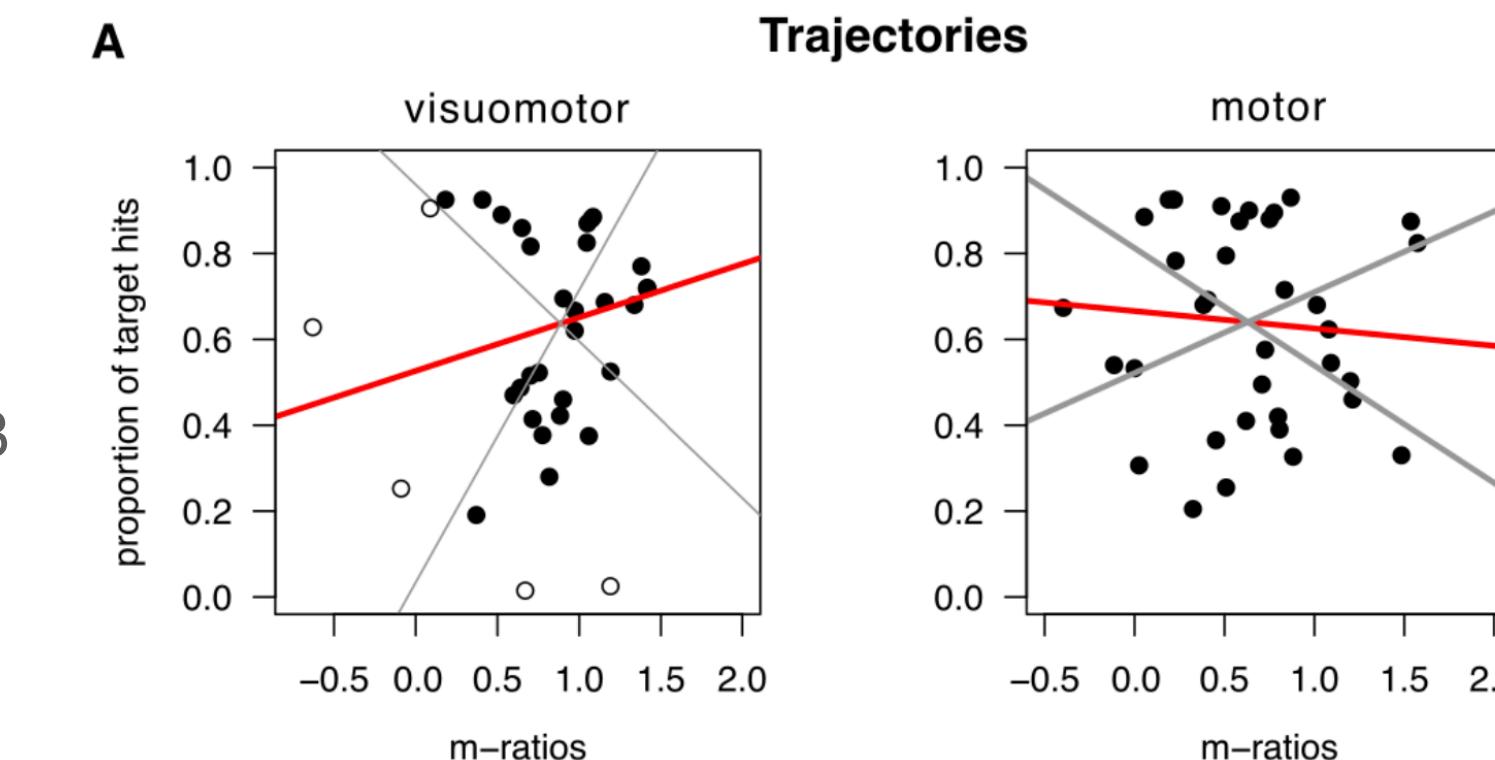
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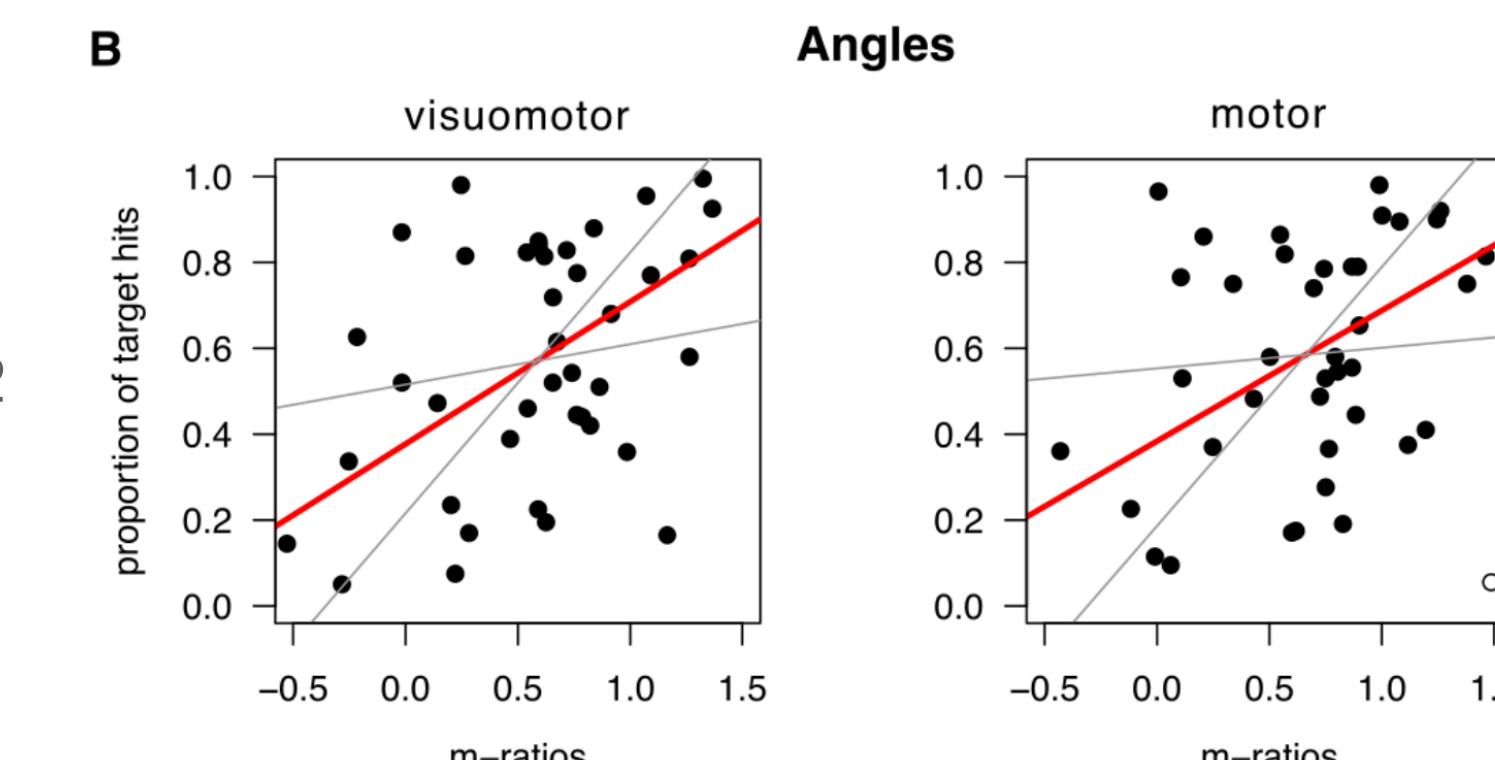
Metacognitive ability vs. expertise



$r = 0.09$
 $BF_{10} = 0.23$



$r = 0.40$
 $BF_{10} = 6.32$



$r = -0.11$
 $BF_{10} = 0.20$

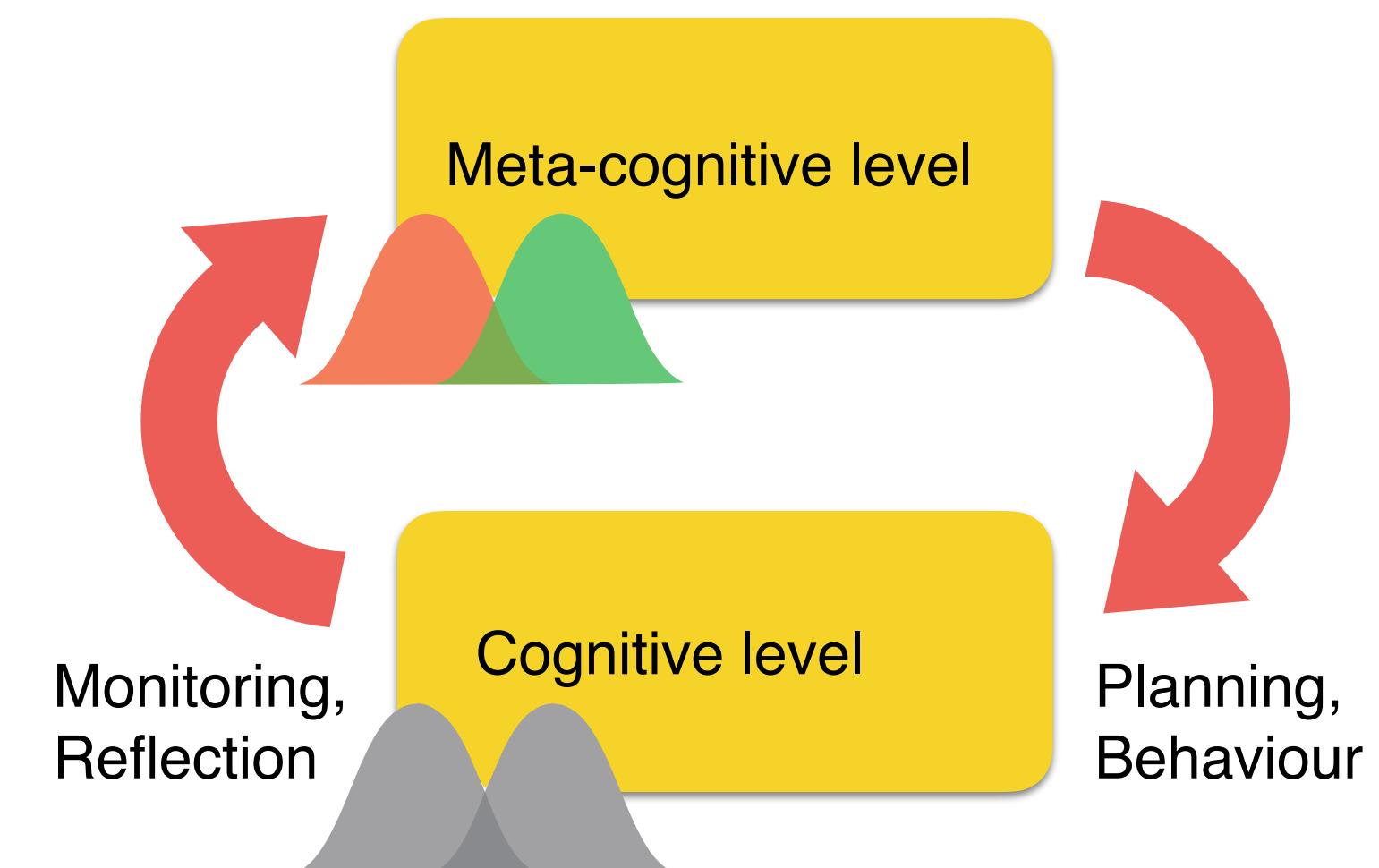
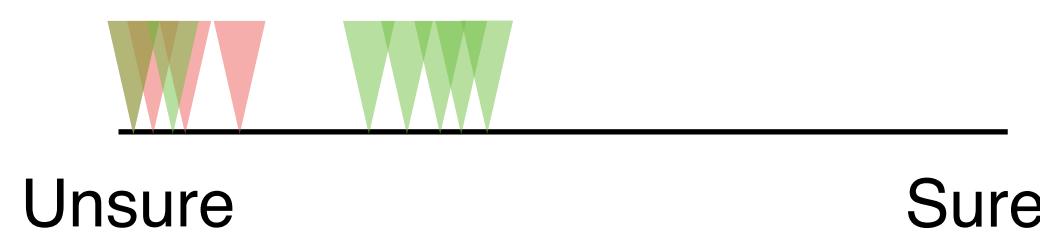
Polina Arbuzova



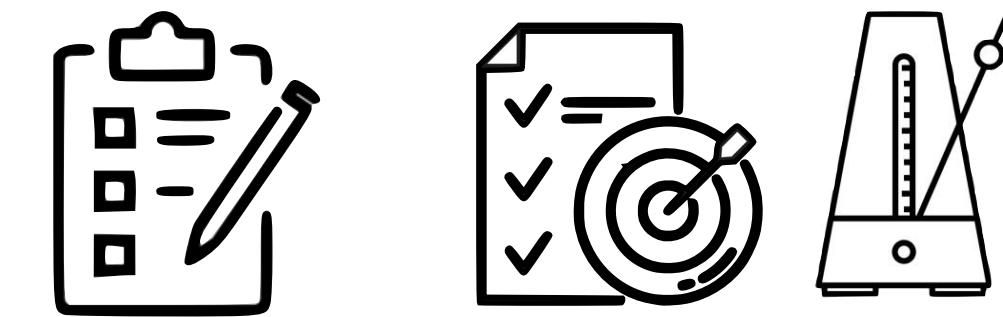
⇒ Only the ability to monitor proximal motor aspects is related to motor performance

Come together: Bridging disciplines

Cognitive science's "metacognition"

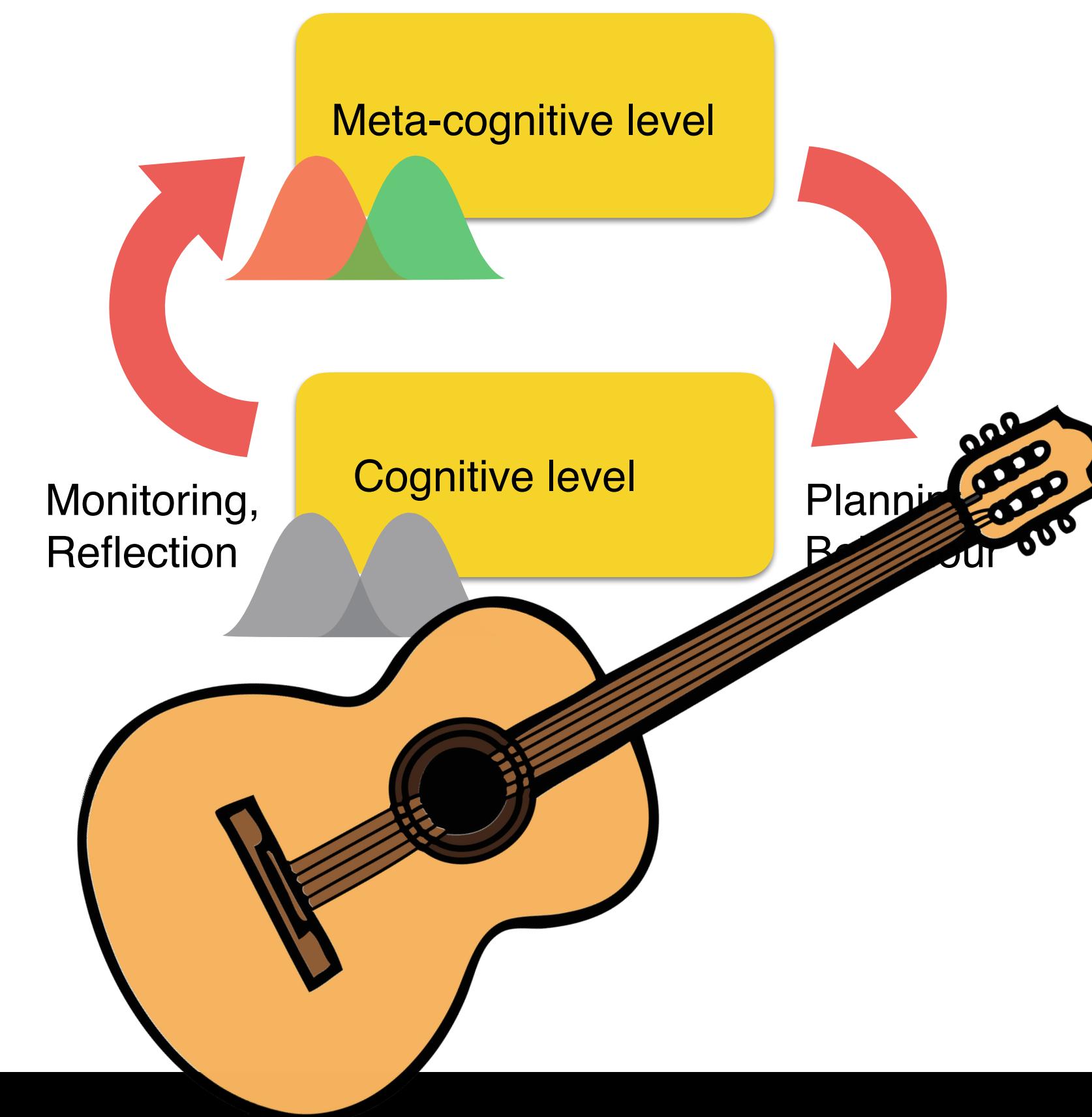
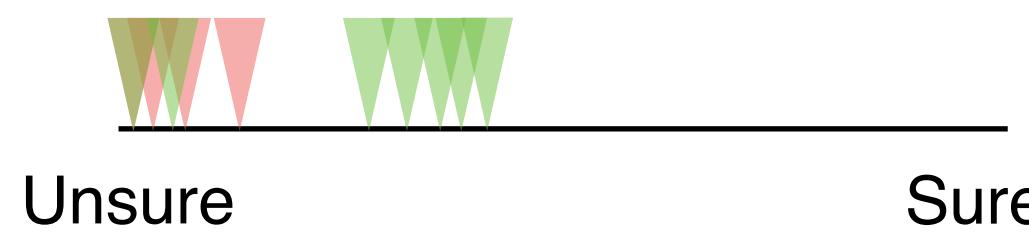


Education research's "metacognition"



Come together: Bridging disciplines

Cognitive science's "metacognition"



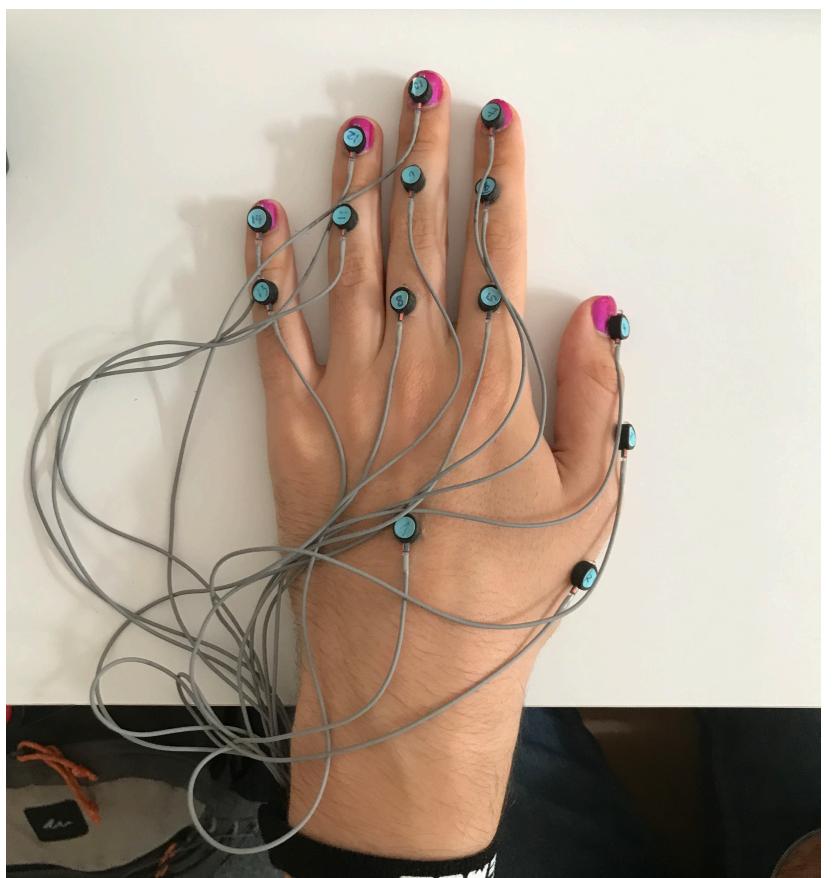
Education research's "metacognition"



Meta-guitar task



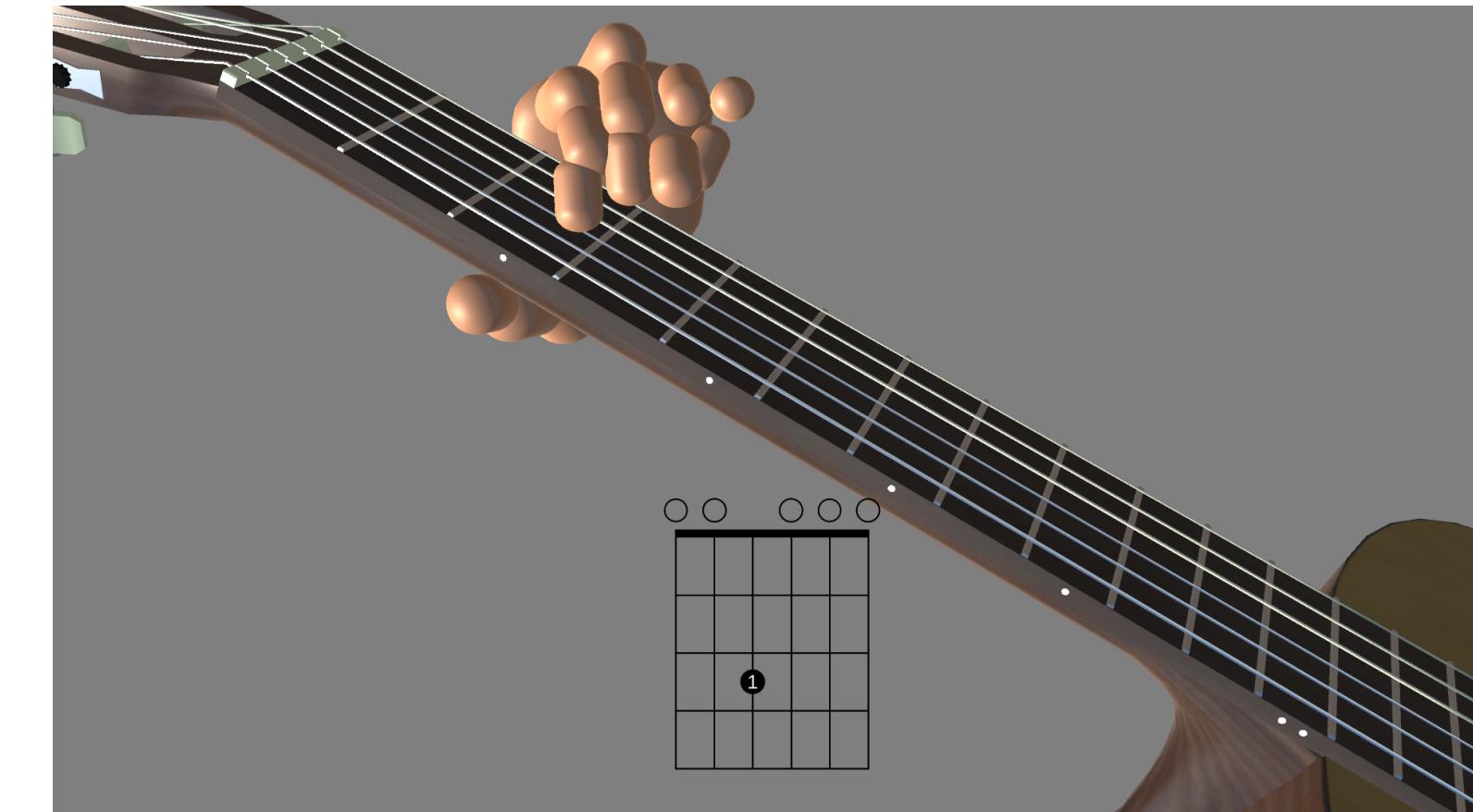
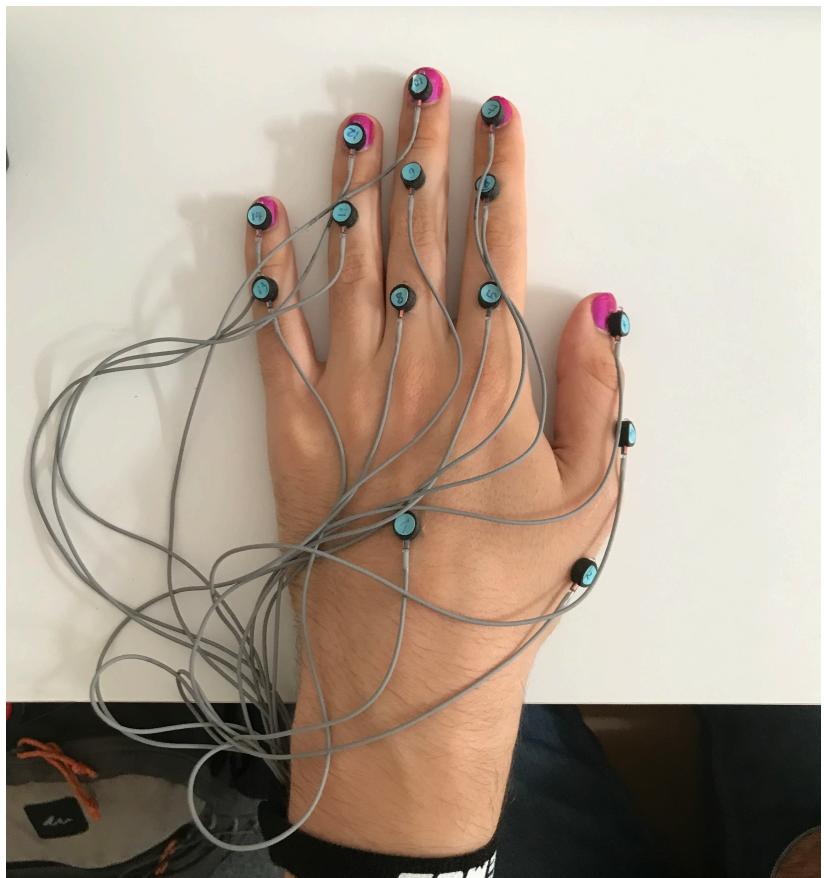
Meta-guitar task



Anthony Ciston



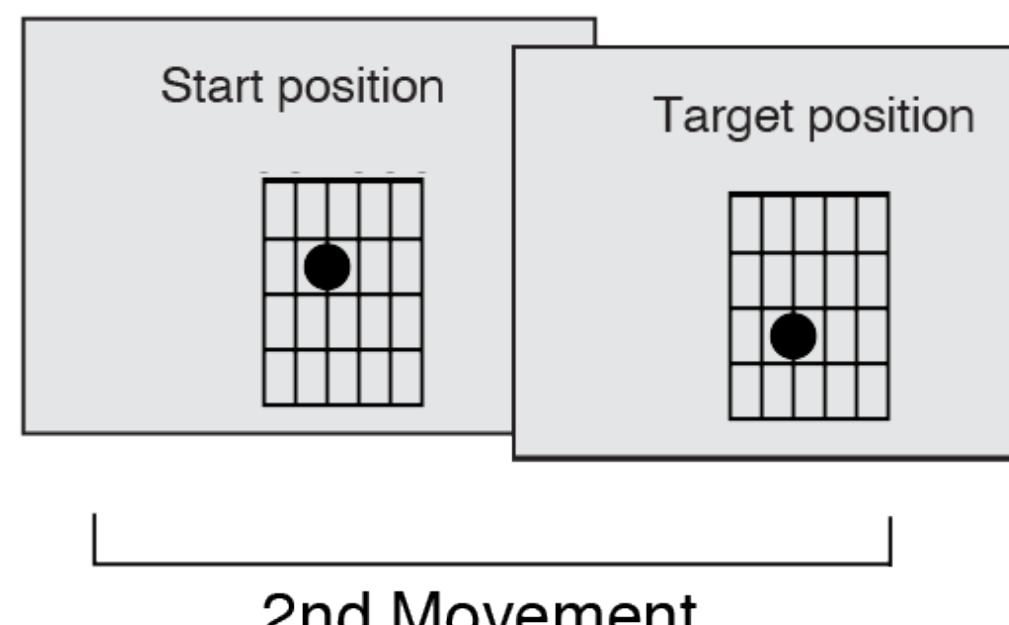
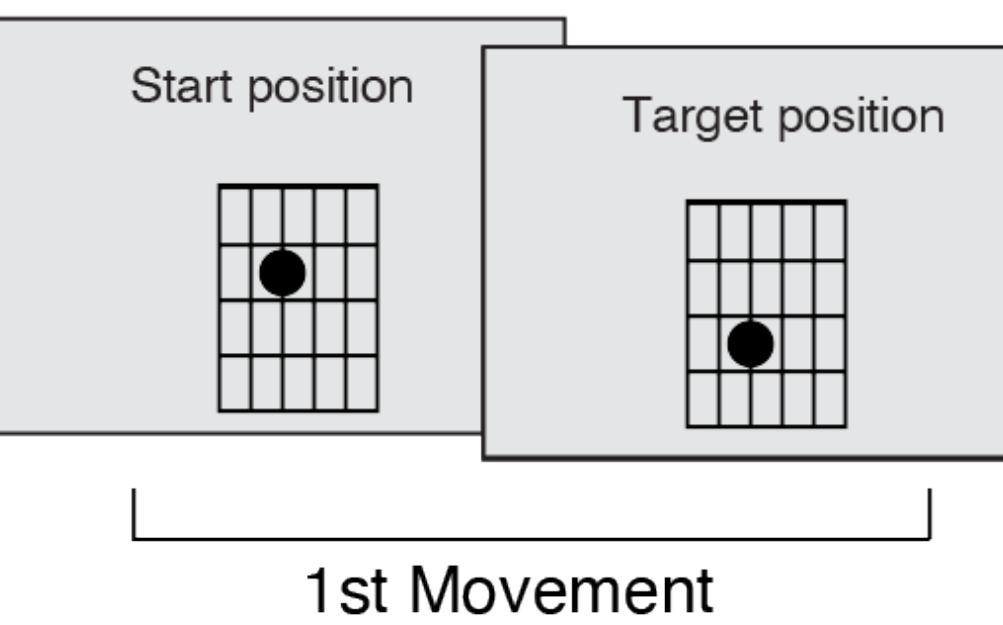
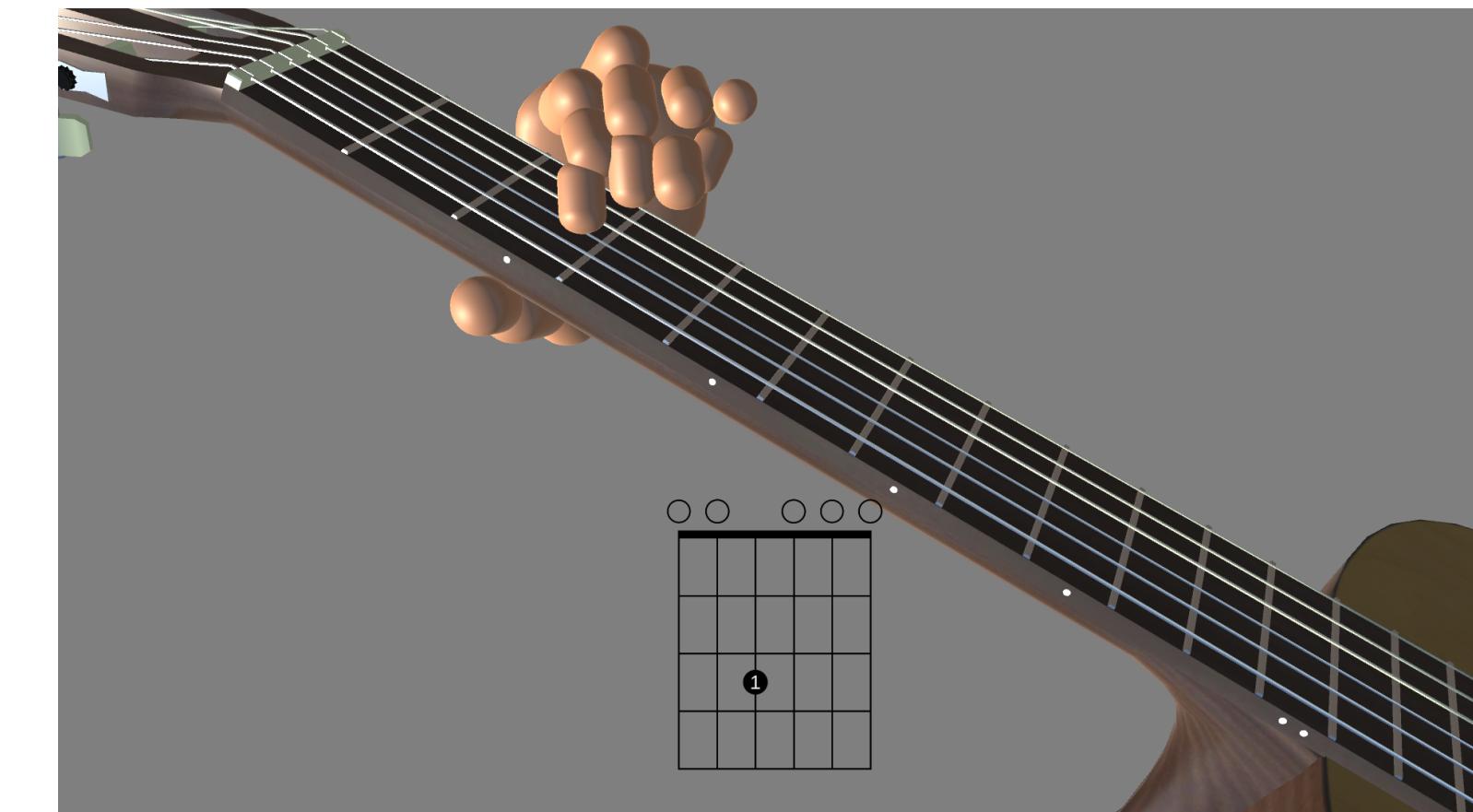
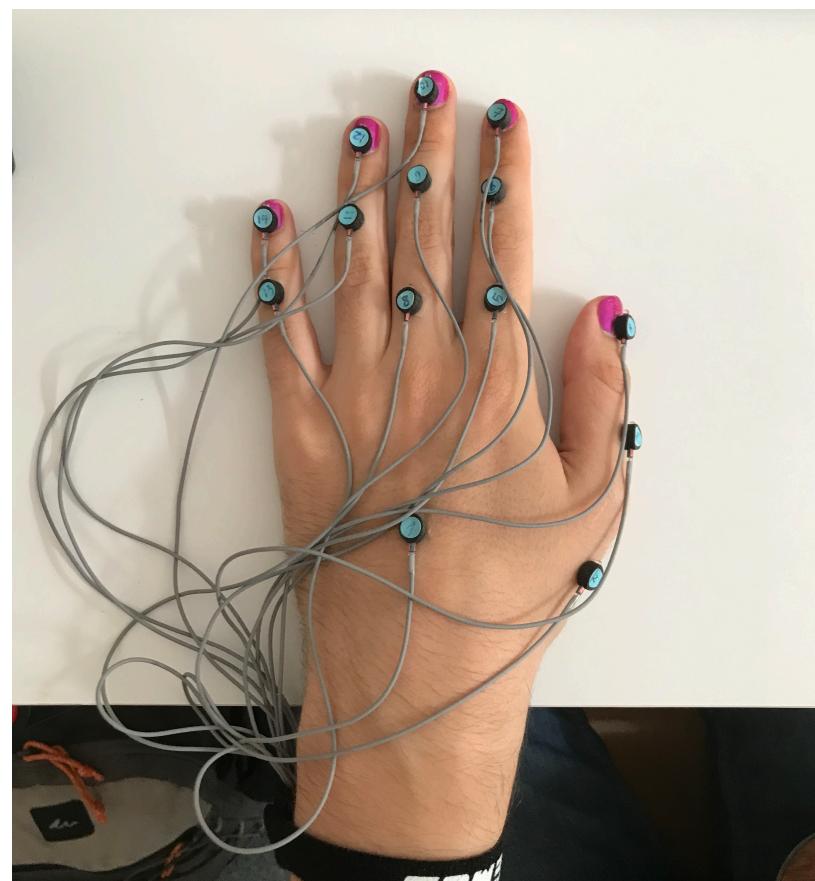
Meta-guitar task



Anthony Ciston



Meta-guitar task



Discrimination

Manipulated?

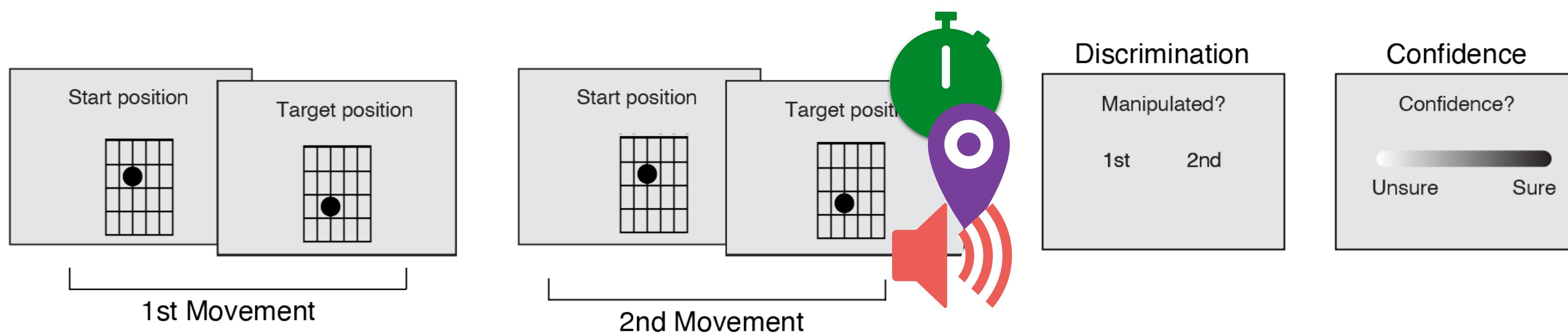
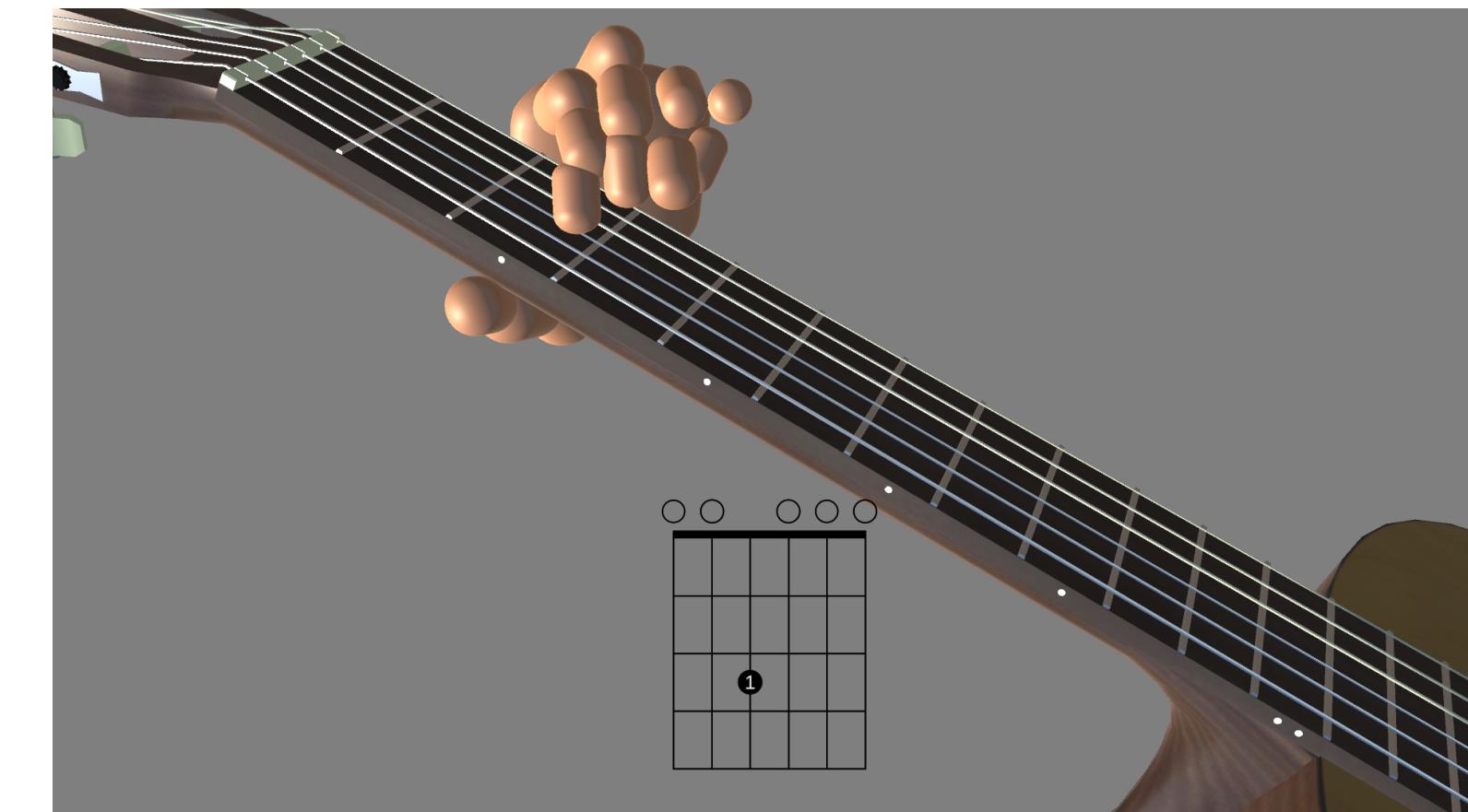
1st 2nd

Confidence

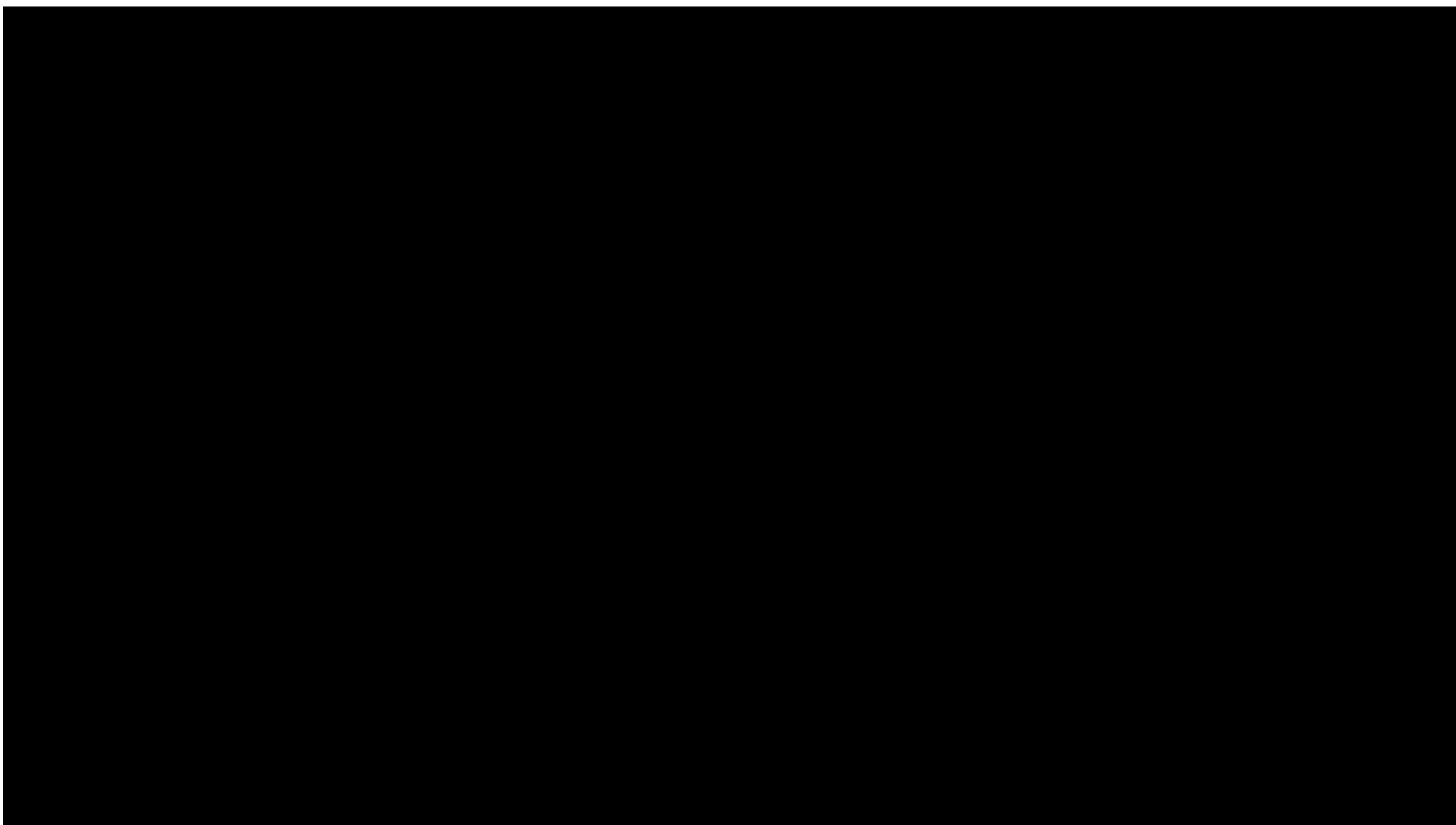
Confidence?

Unsure Sure

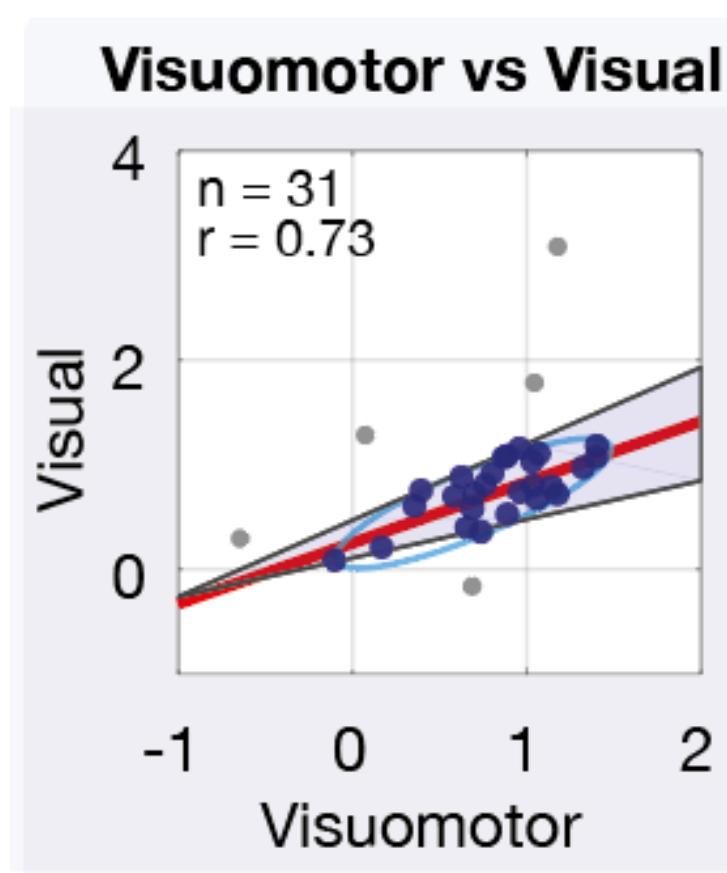
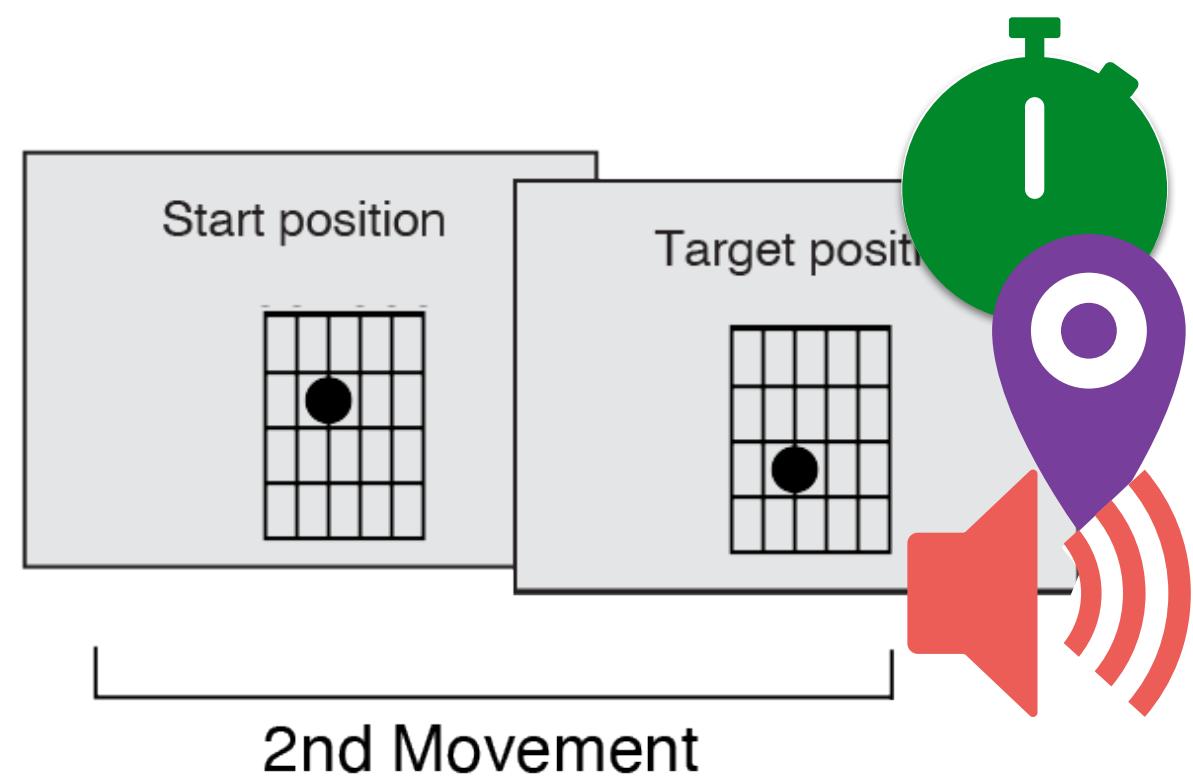
Meta-guitar task



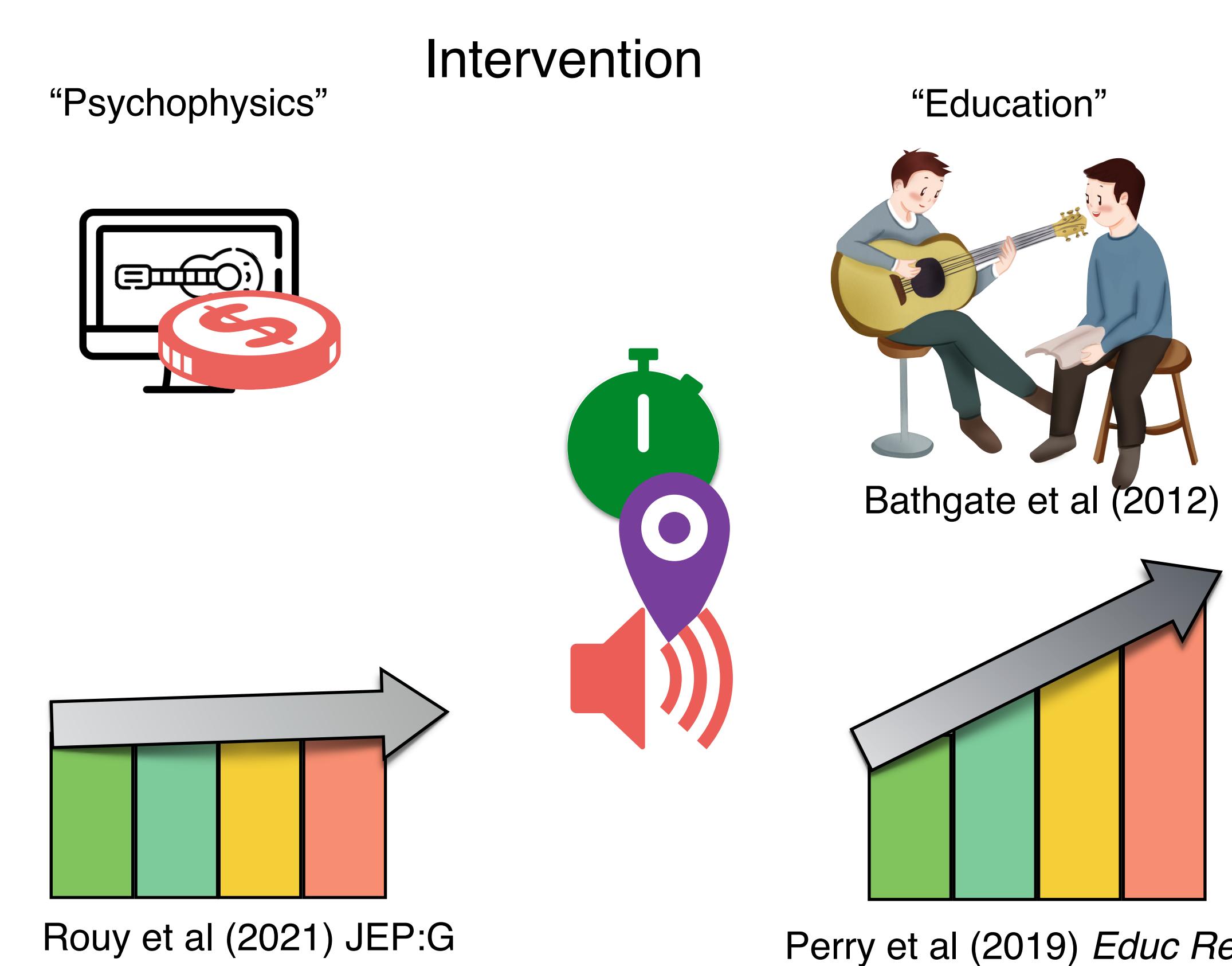
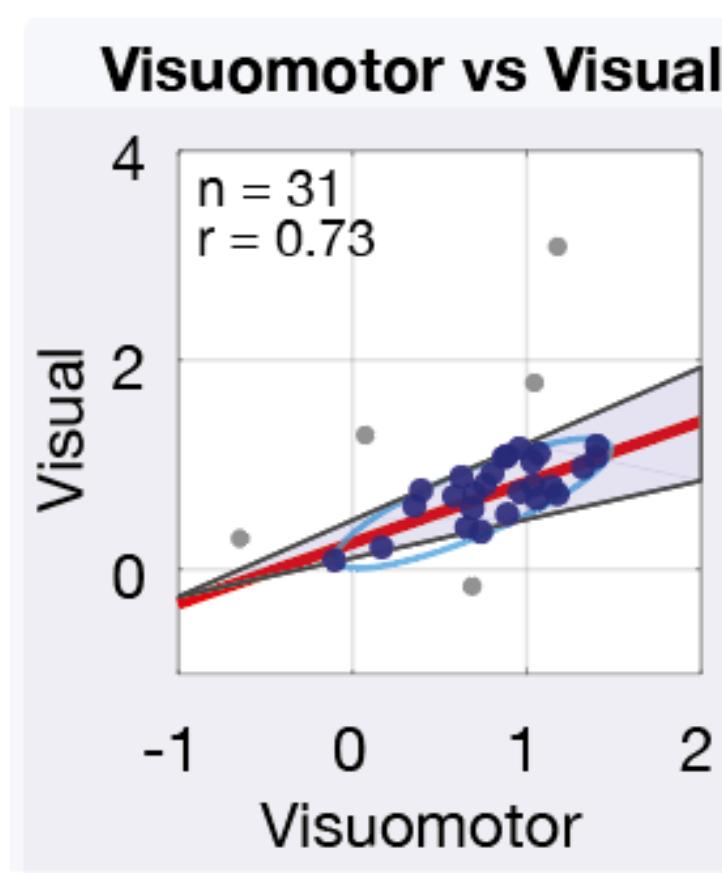
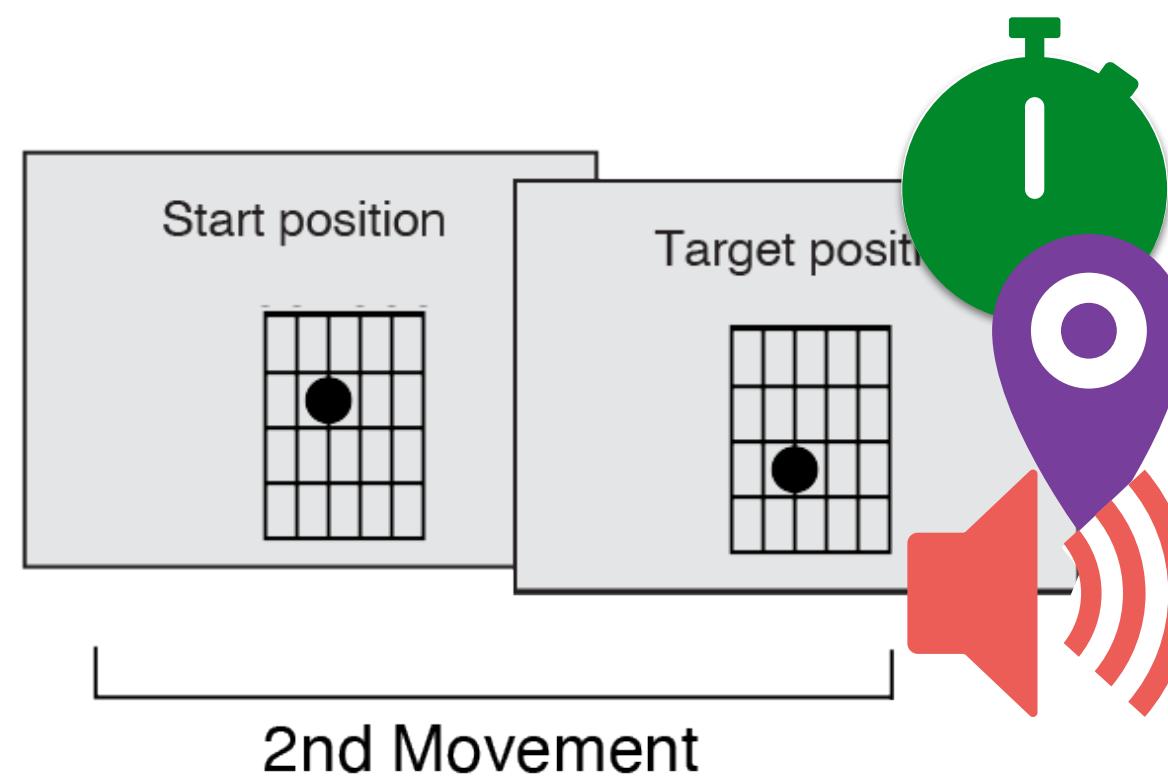
Meta-guitar task



Probing domain-generality



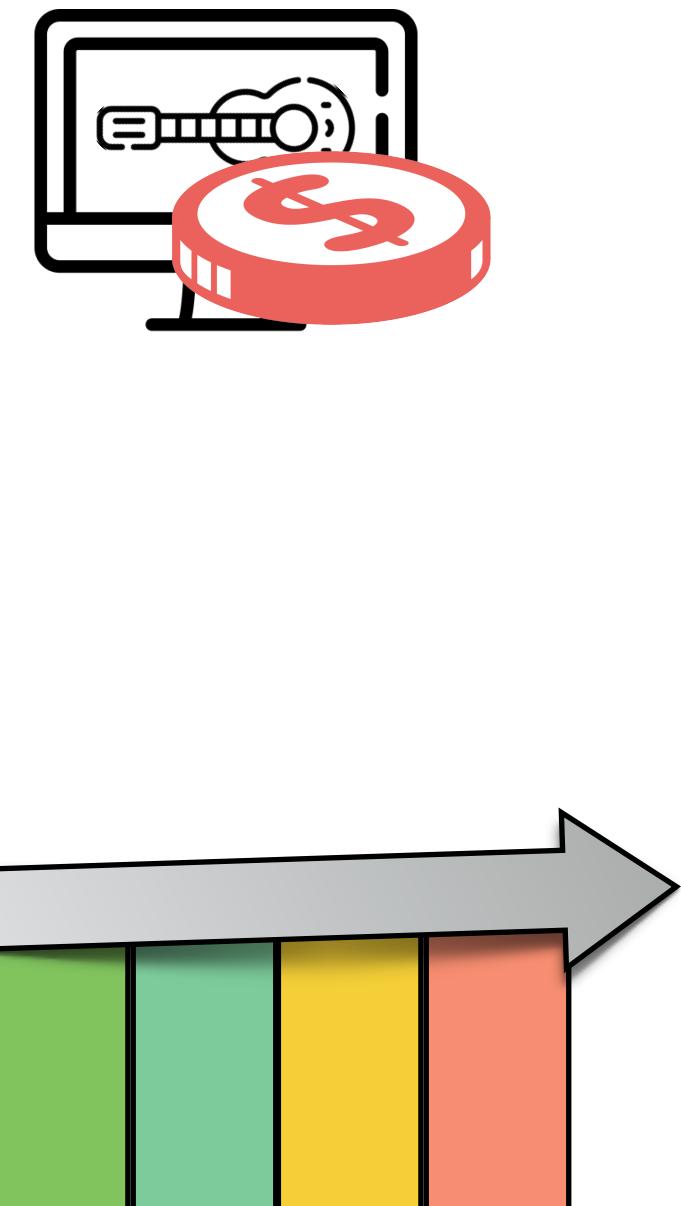
Probing domain-generality



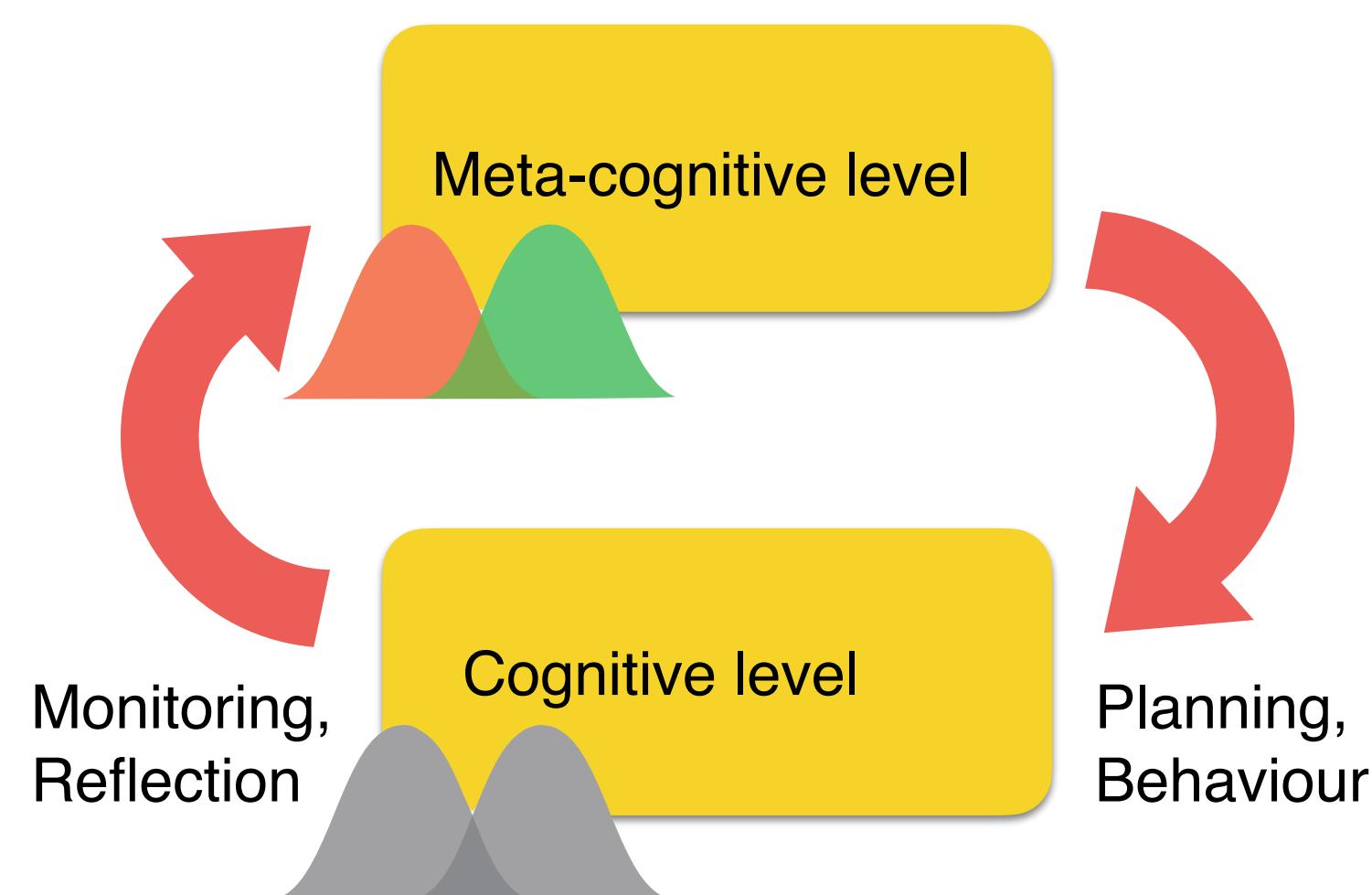
Effects of interventions

Conflicting results

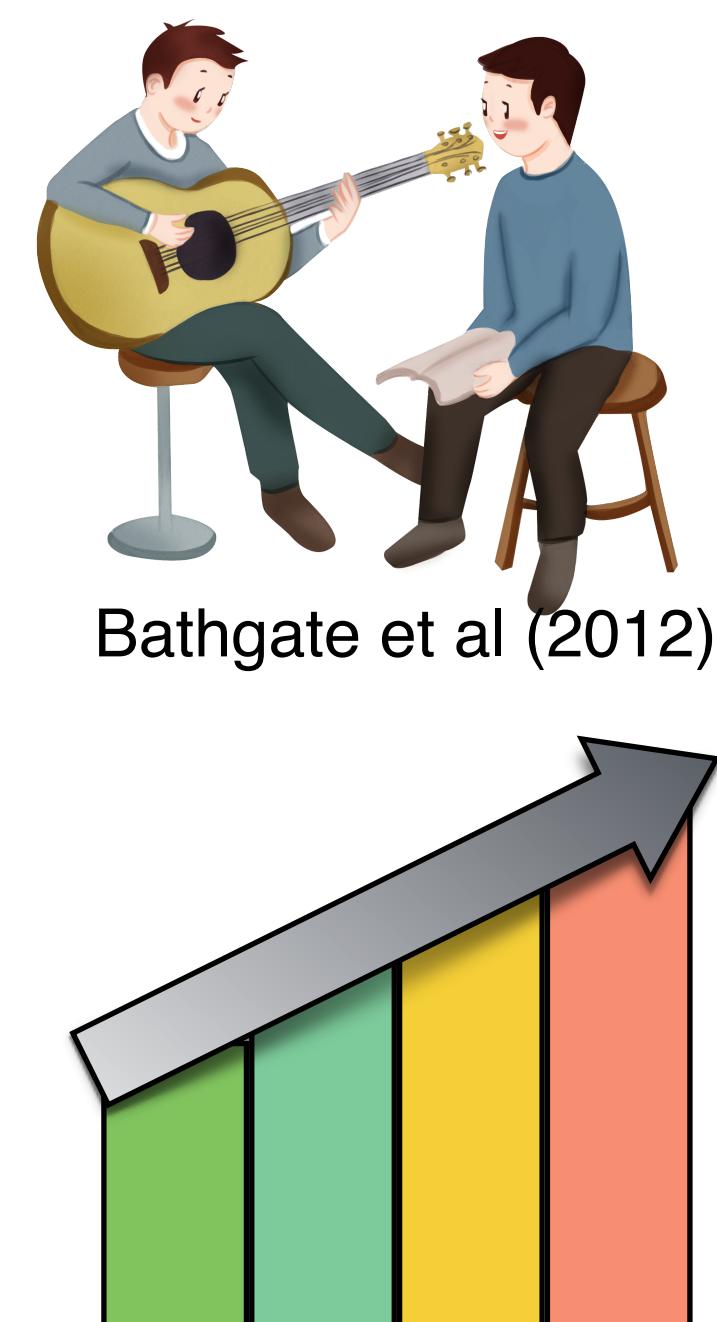
“Psychophysics”



Rouy et al (2021) JEP:G



“Education”



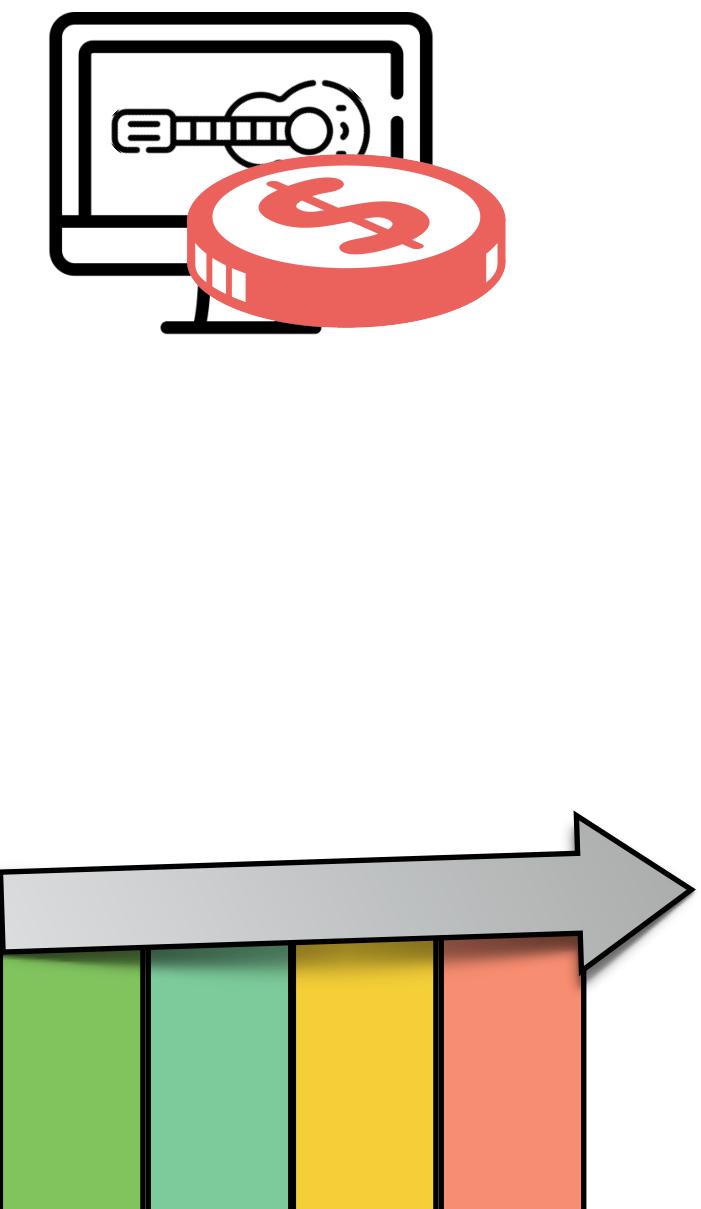
Bathgate et al (2012)

Perry et al (2019) Educ Rev

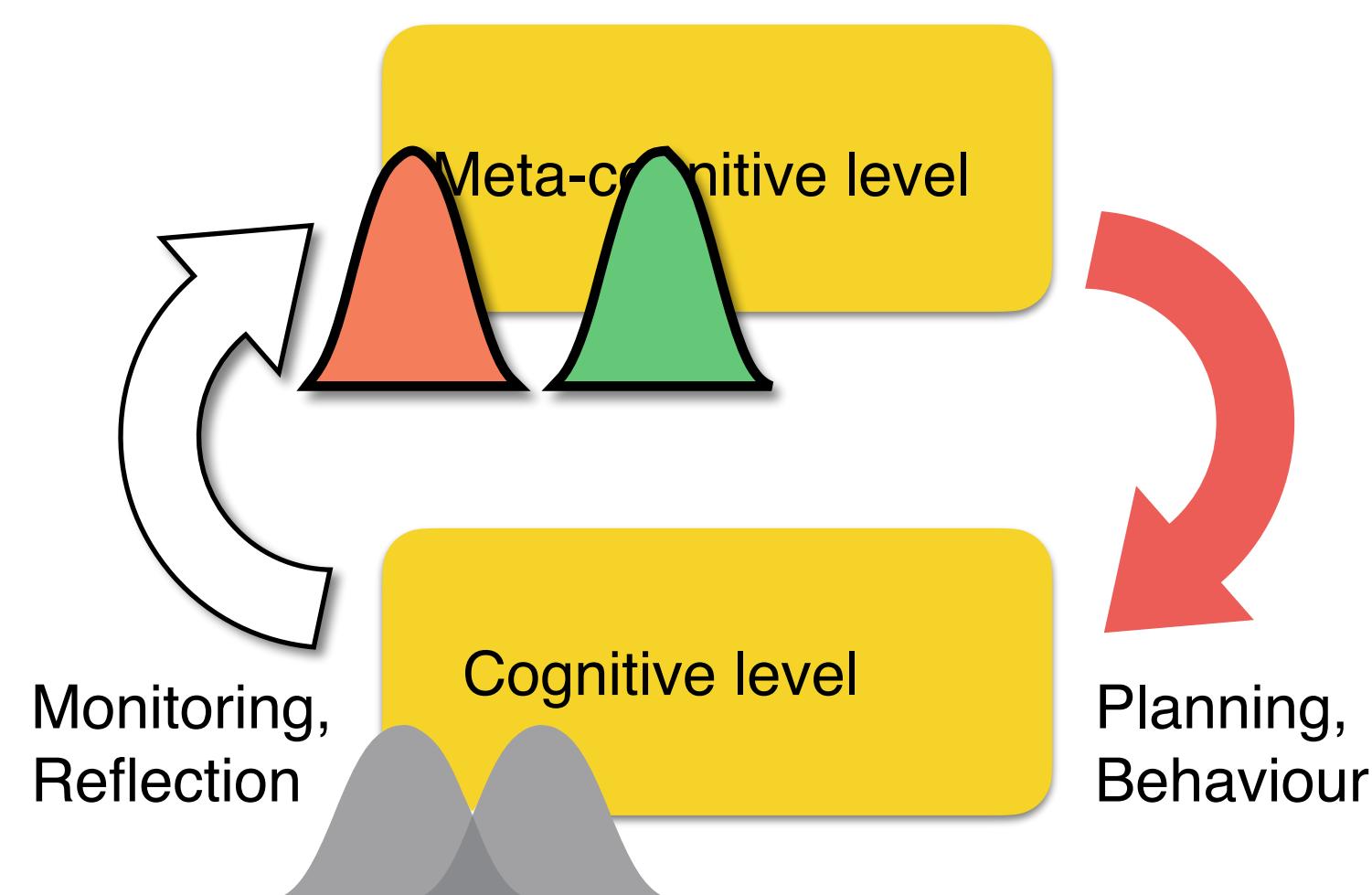
Effects of interventions

Conflicting results

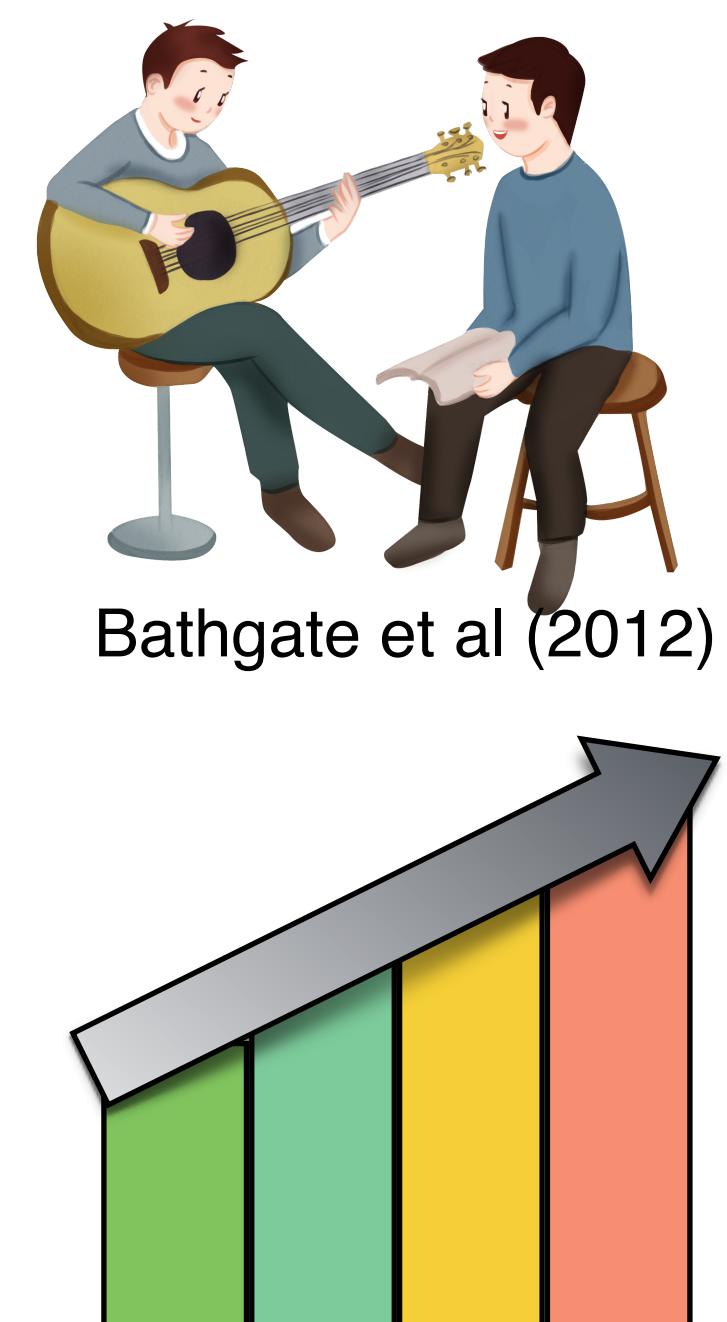
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Rouy et al (2021) JEP:G



“Education”



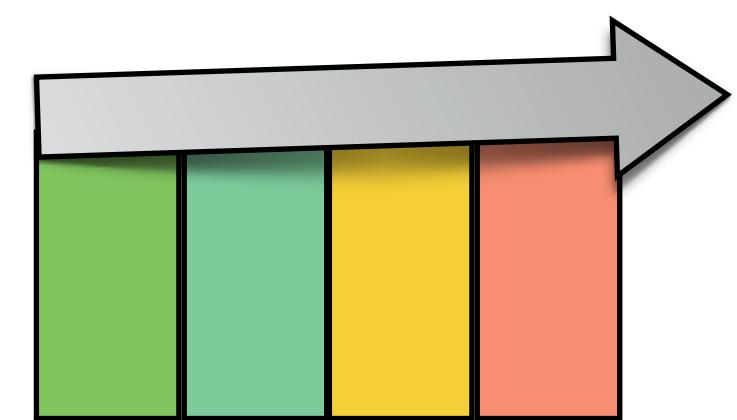
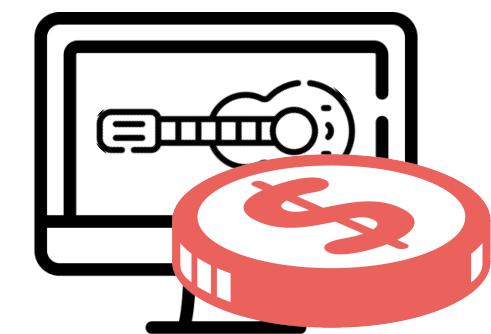
Bathgate et al (2012)

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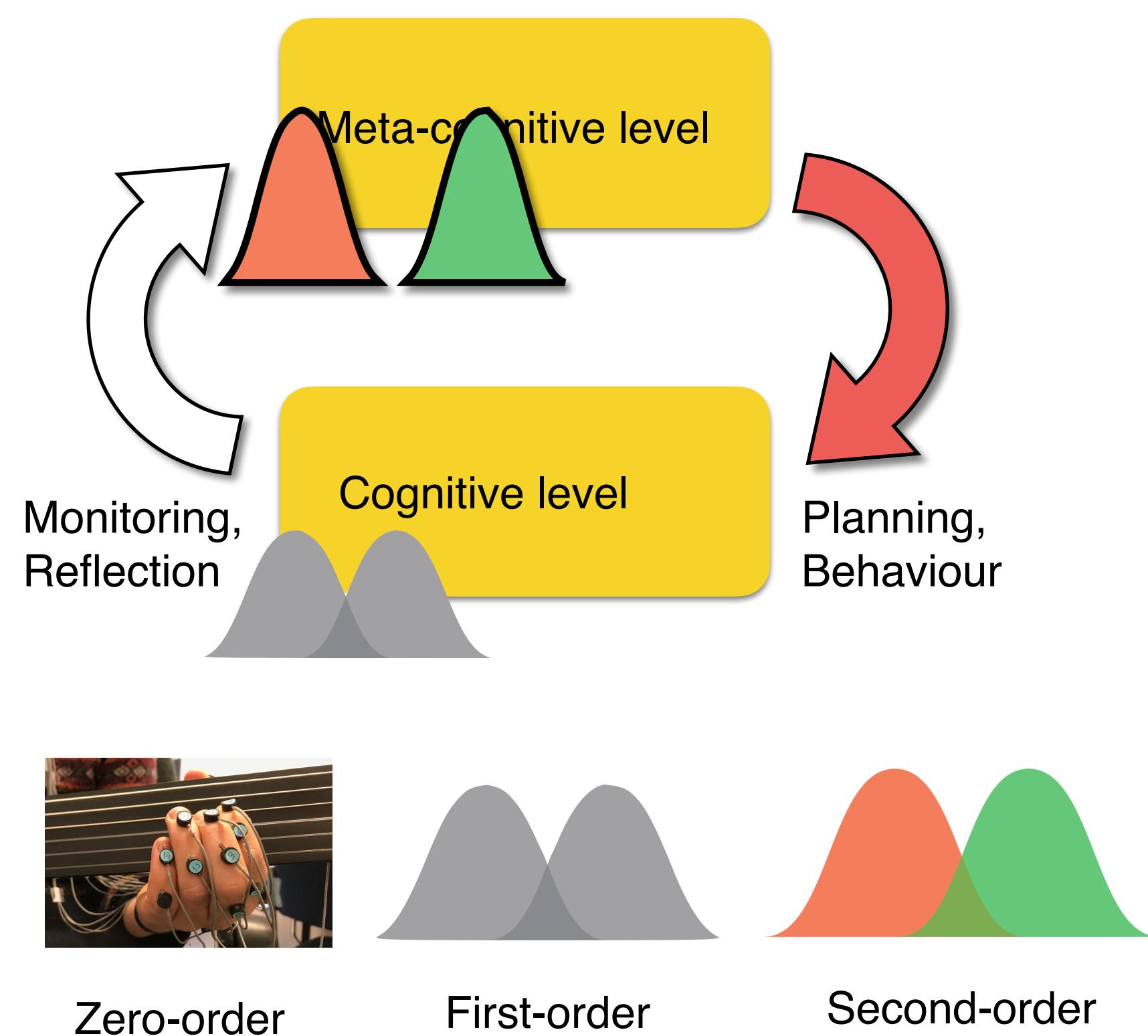
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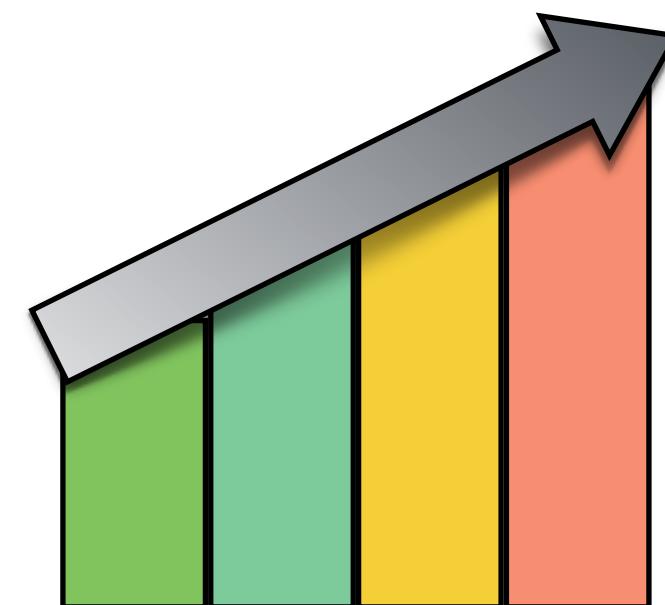
Rouy et al (2021) JEP:G



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Bathgate et al (2012)

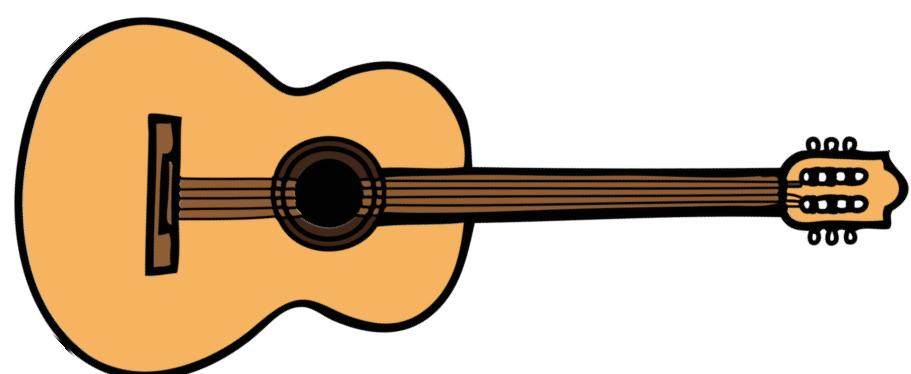


Perry et al (2019) Educ Rev

Summary



Motor tasks are interesting because they allow us to test metacognitive control in ecologically valid ways



The meta-guitar task will allow us to measure the interplay between metacognitive interventions and motor learning



I hope this will teach us something about the discrepancies between fields.