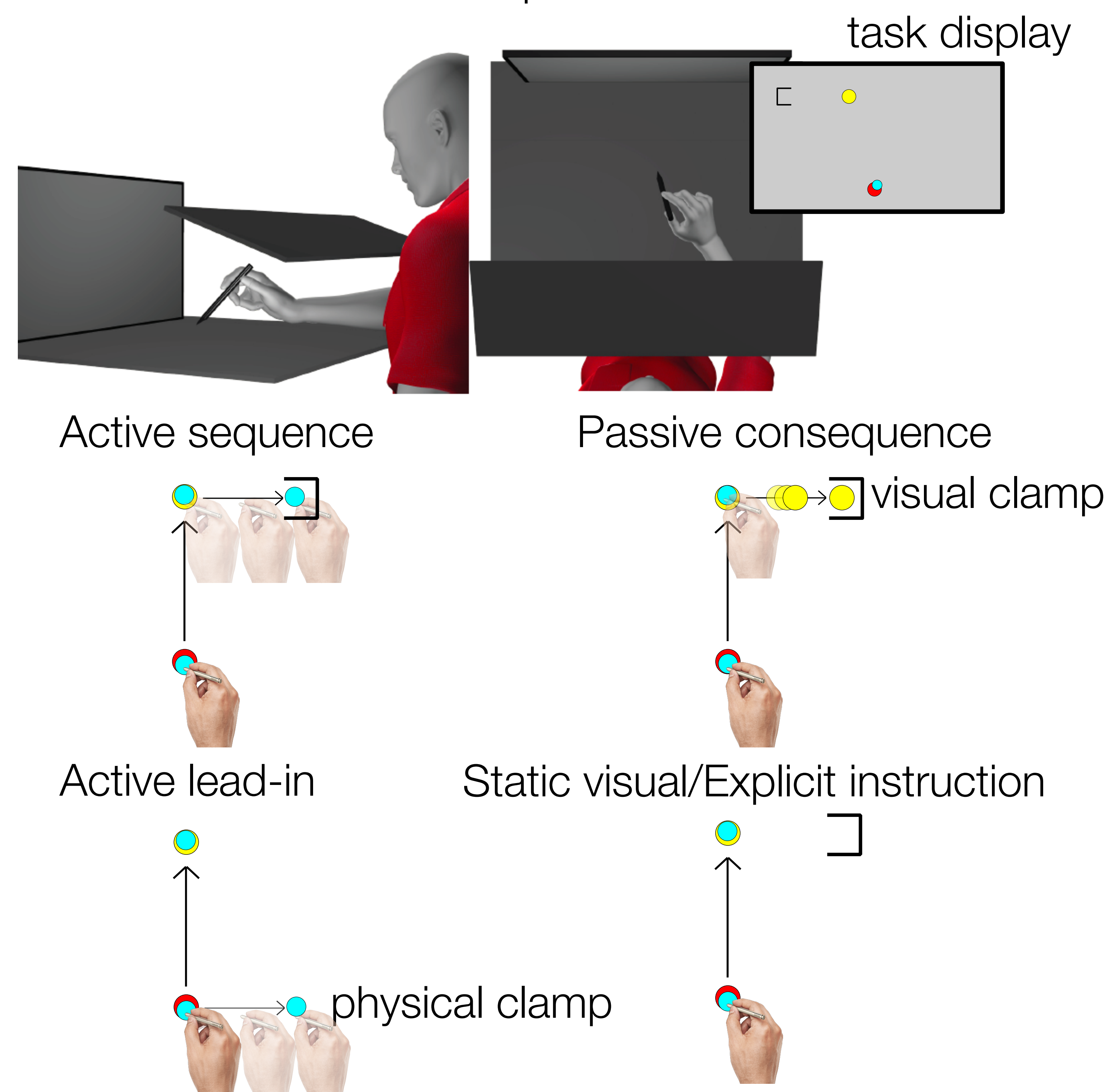


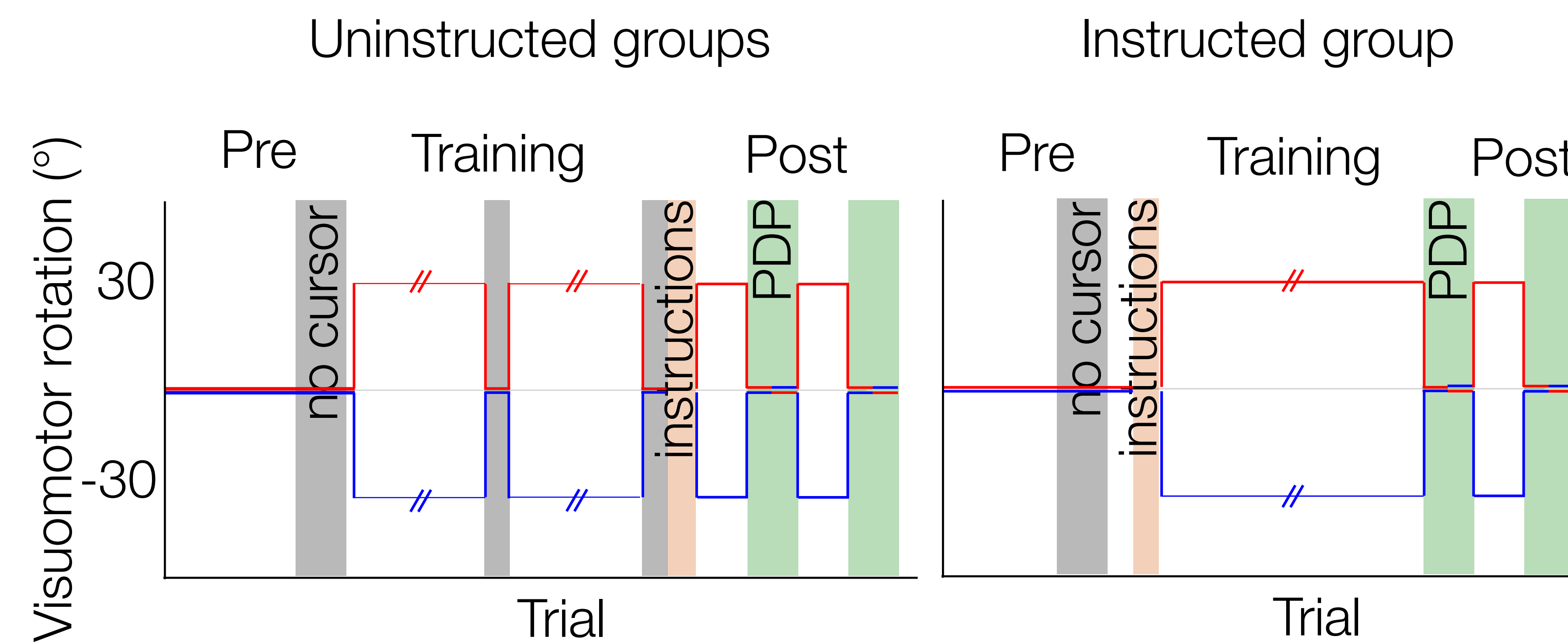
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Context is critical for dual learning

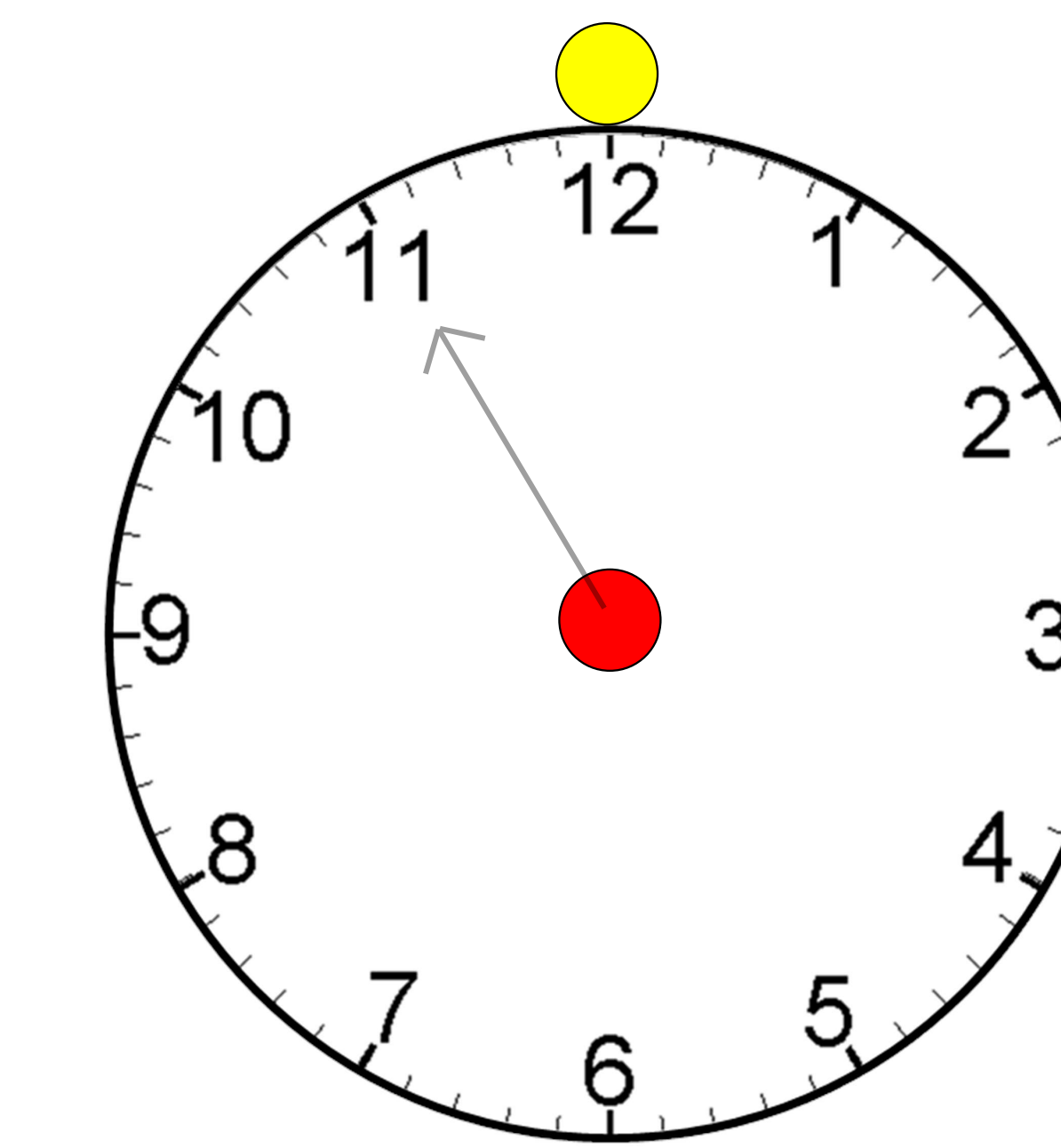
The motor system can actively compensate and adapt to two or more visuomotor perturbations simultaneously ("dual adaptation") but only when each visuomotor mapping is associated with a distinctive cue. Here, we examined the efficacy of multiple cues in facilitating dual visuomotor adaptation including active follow-through movements, passive follow-through movements, active three-part lead-in movements, and a static visual control cue. In the final intervention, we gave participants a dual aiming strategy to dissociate the subcomponents of dual adaptation. To do this, we instructed an Explicit-Instruction group with a compensatory strategy about the perturbations (30° CW or 30° CCW rotations) and their relationships to each context (visual cues), and compared their performance to a No-Instruction group. Following perturbed training, participants were asked to either use or ignore the strategy as they reached without visual feedback. This Process Dissociation Procedure allowed us to tease apart the implicit and explicit contributions to dual adaptation.



Probing the efficiency of each context

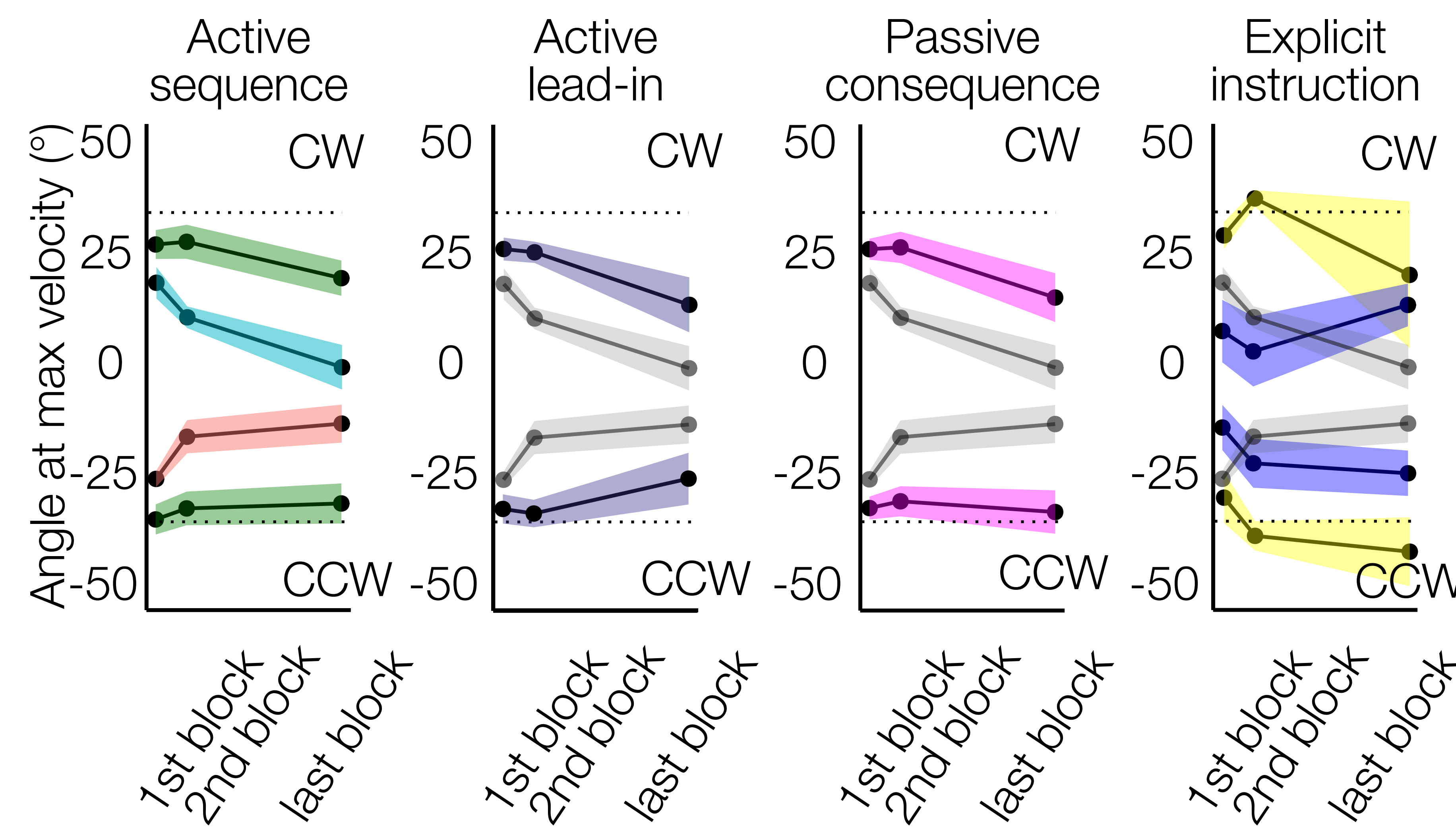


Probing the role of awareness

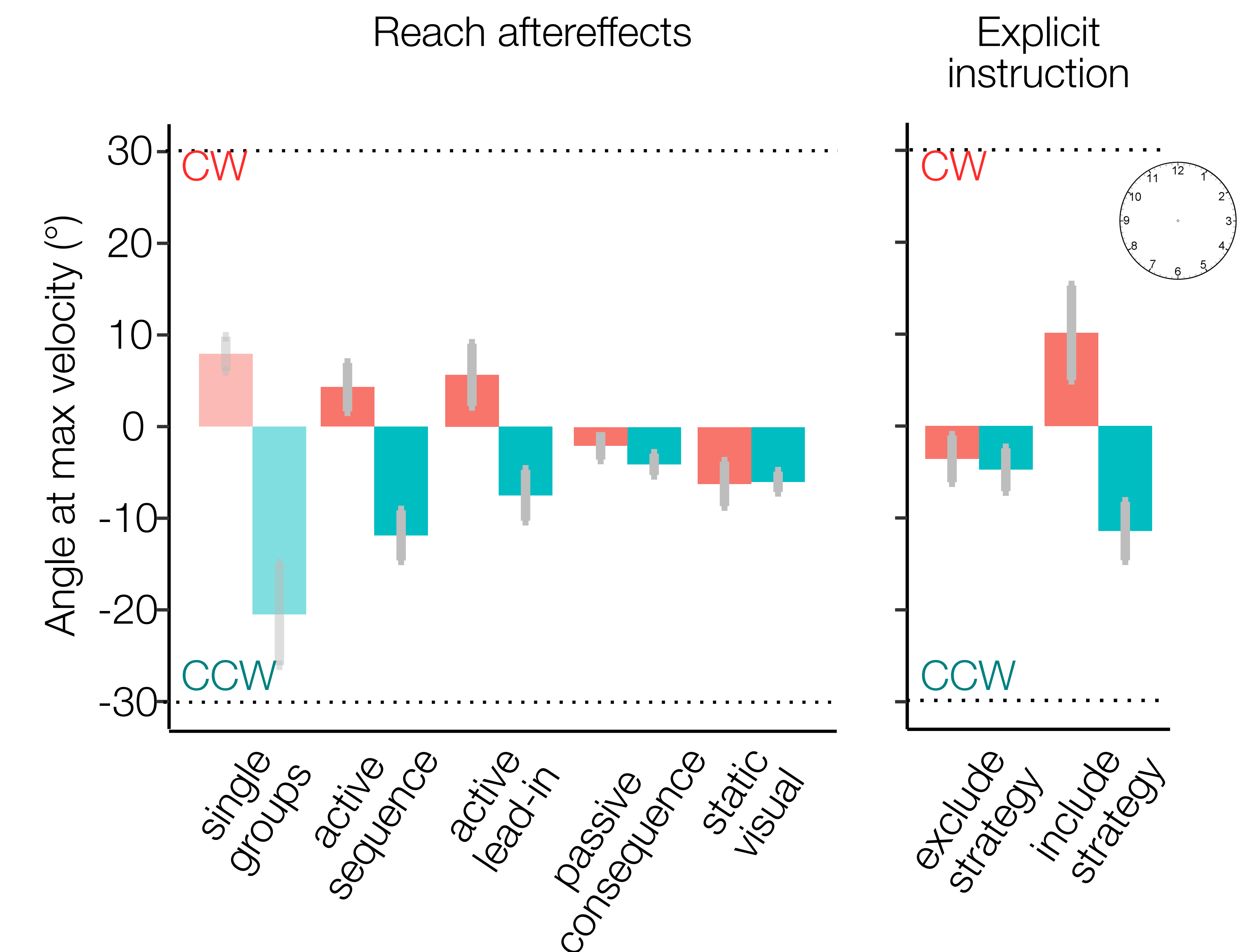


"Imagine your starting point as being at the centre of a clock face, and you move your hand to the 12 position at the top. If you see the box on the **RIGHT**, aim for the 11 so your cursor ultimately reaches the target at 12."

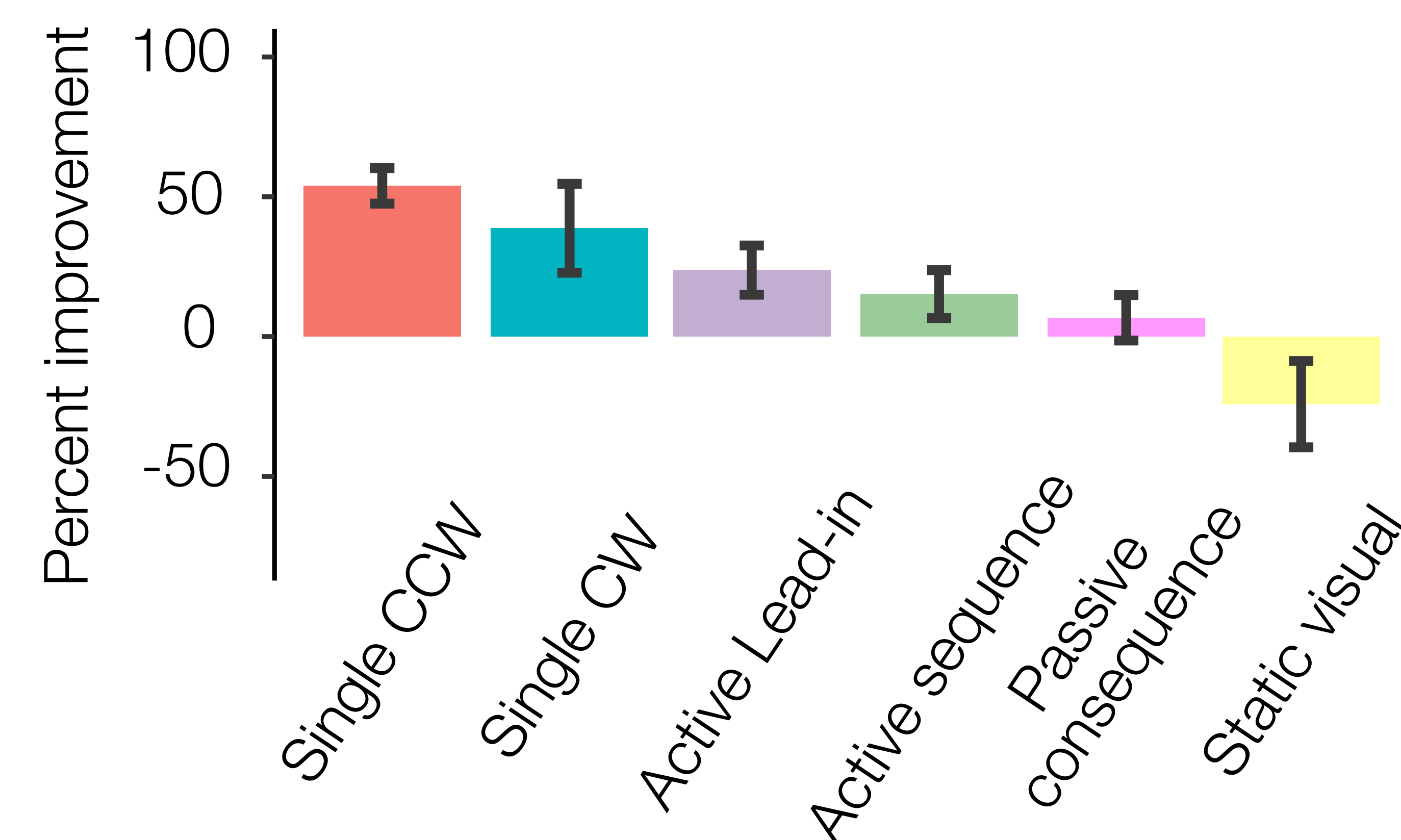
Actively produced cues facilitate dual adaptation



Use of aiming strategies leads to explicit learning



Motor-based (intrinsic) cues tend to be more useful



- Movement sequences need to be actively produced to facilitate dual learning
- When cues are useful to the CNS, implicit processes are engaged
- When cues aren't useful to the CNS, conscious strategies can exclusively elicit explicit processes to facilitate learning

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