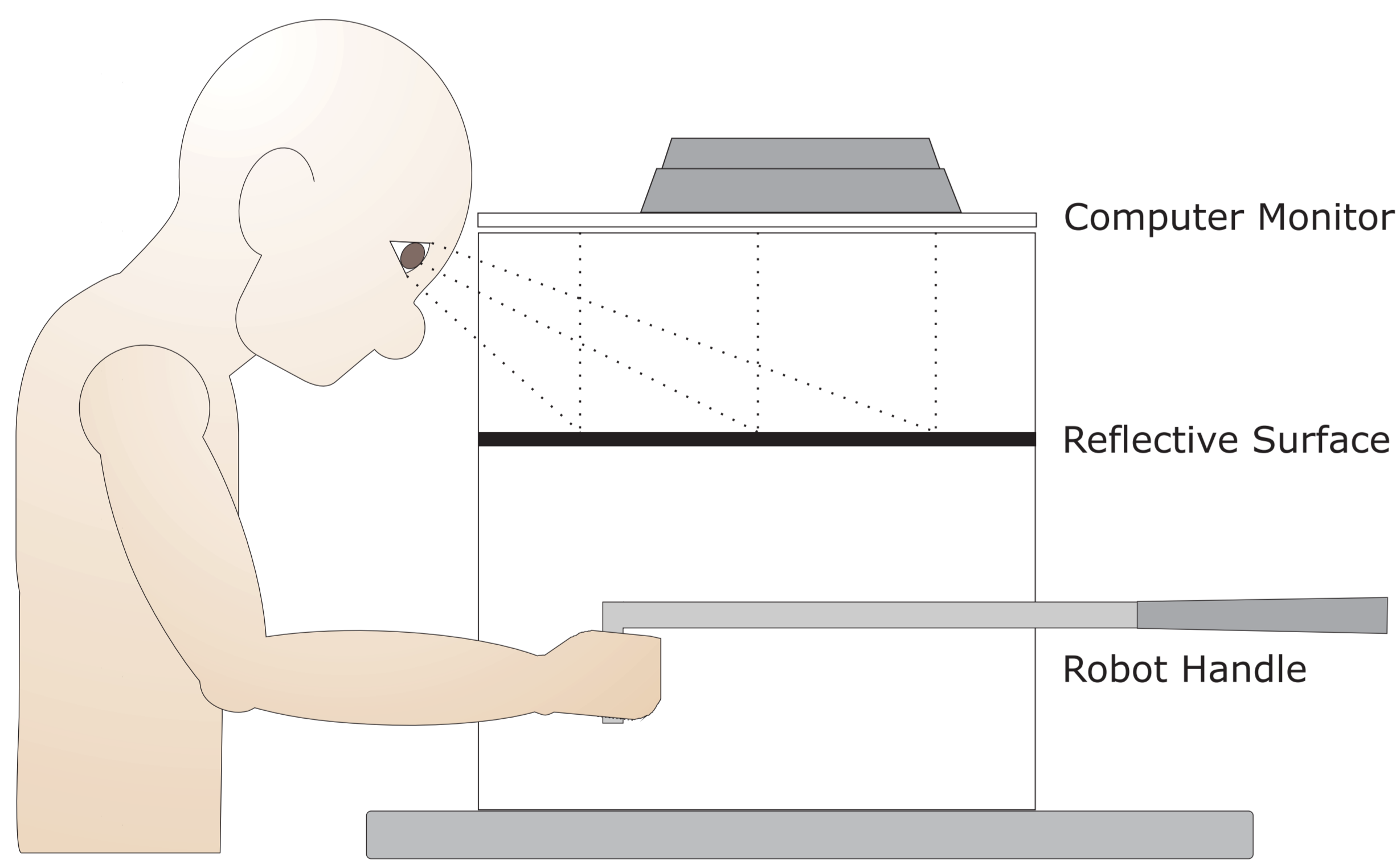


## INTRODUCTION

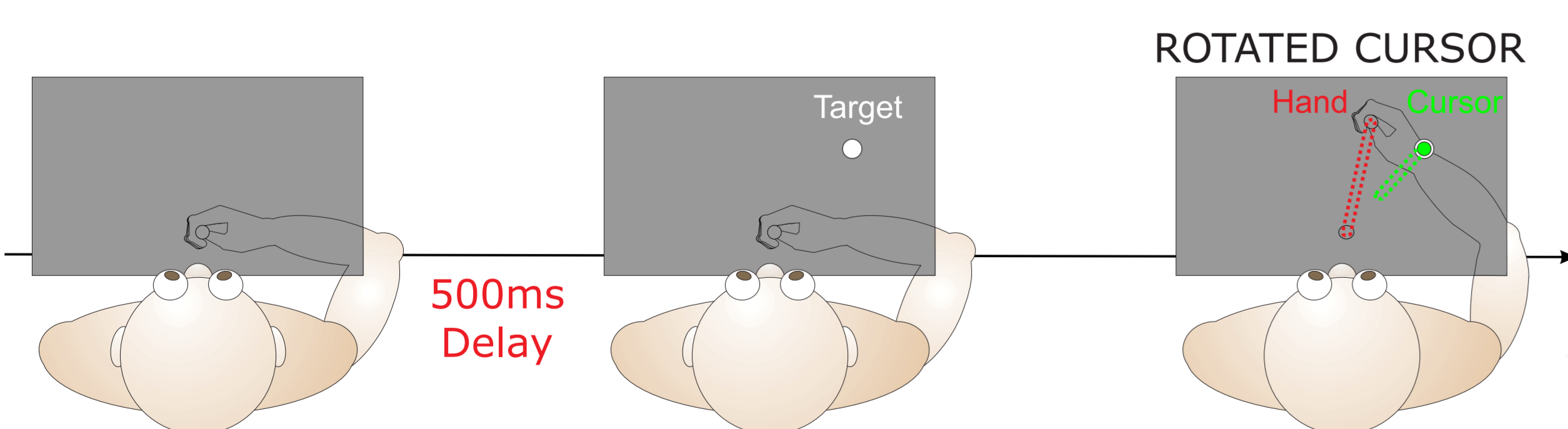
When subjects are presented with distorted visual feedback of their hand during a goal-directed movement (i.e. subjects view a cursor representing their hand that is shifted from their hand's actual position while reaching in a virtual reality environment), they typically adapt their movements in order to bring the cursor to the target, thus reducing reaching errors. Interestingly, when subjects then reach without a cursor, they continue to produce adapted reaches (i.e. reach aftereffects). These reach aftereffects are evidence that subjects have adapted to the visuomotor distortion, and are used to quantify the magnitude of motor adaptation (Cressman and Henriques, 2009). The purpose of this study is to assess whether reach adaptation is due to a long-lasting change in the motor system, or if it is also influenced by a temporary motor memory representation.

## METHODS

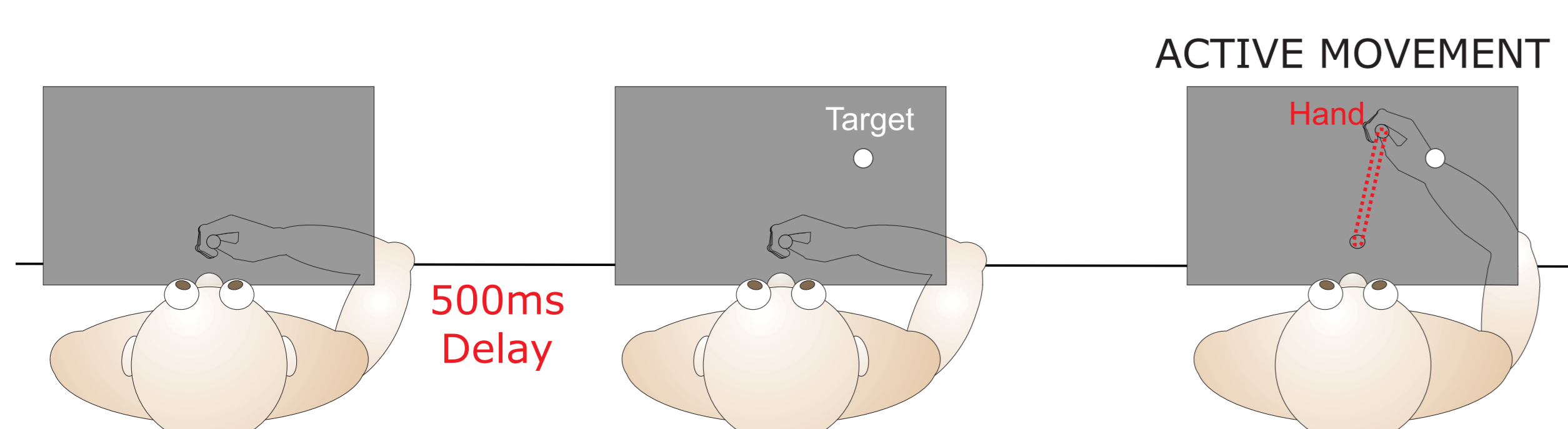
Seven subjects trained to reach to a single visual target while seeing a cursor that was rotated 30° clockwise relative to their hand's actual position. Reach aftereffect trials were completed immediately following the training trials and again after a 5-minute delay at 7 different time points during the training trials with the rotated cursor. The time courses of immediate and delayed reach aftereffects were compared in order to determine the influence of a delay on reach performance.



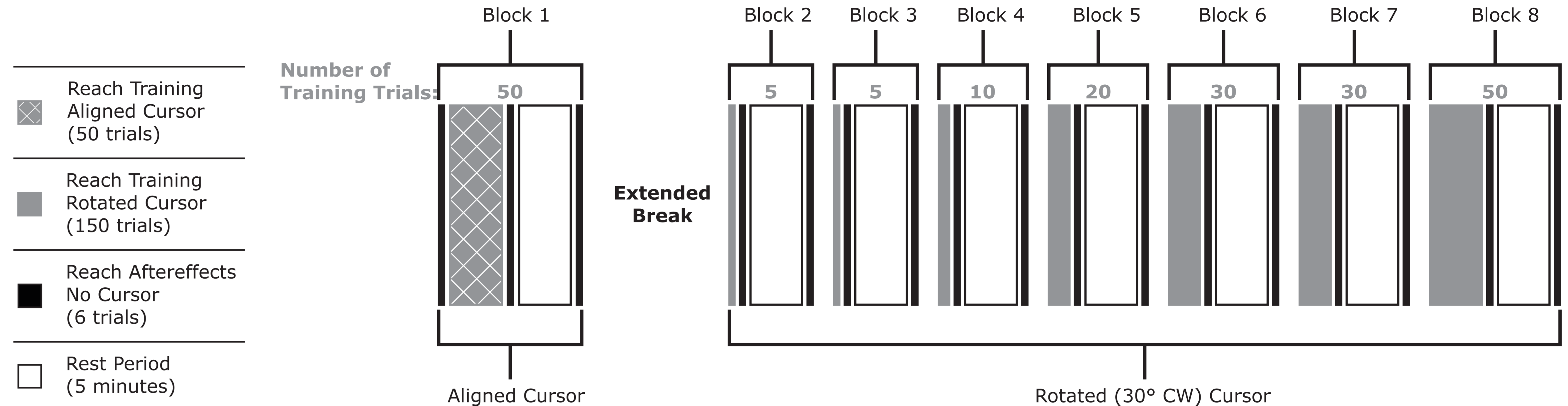
### Reach Training Task (cursor feedback)



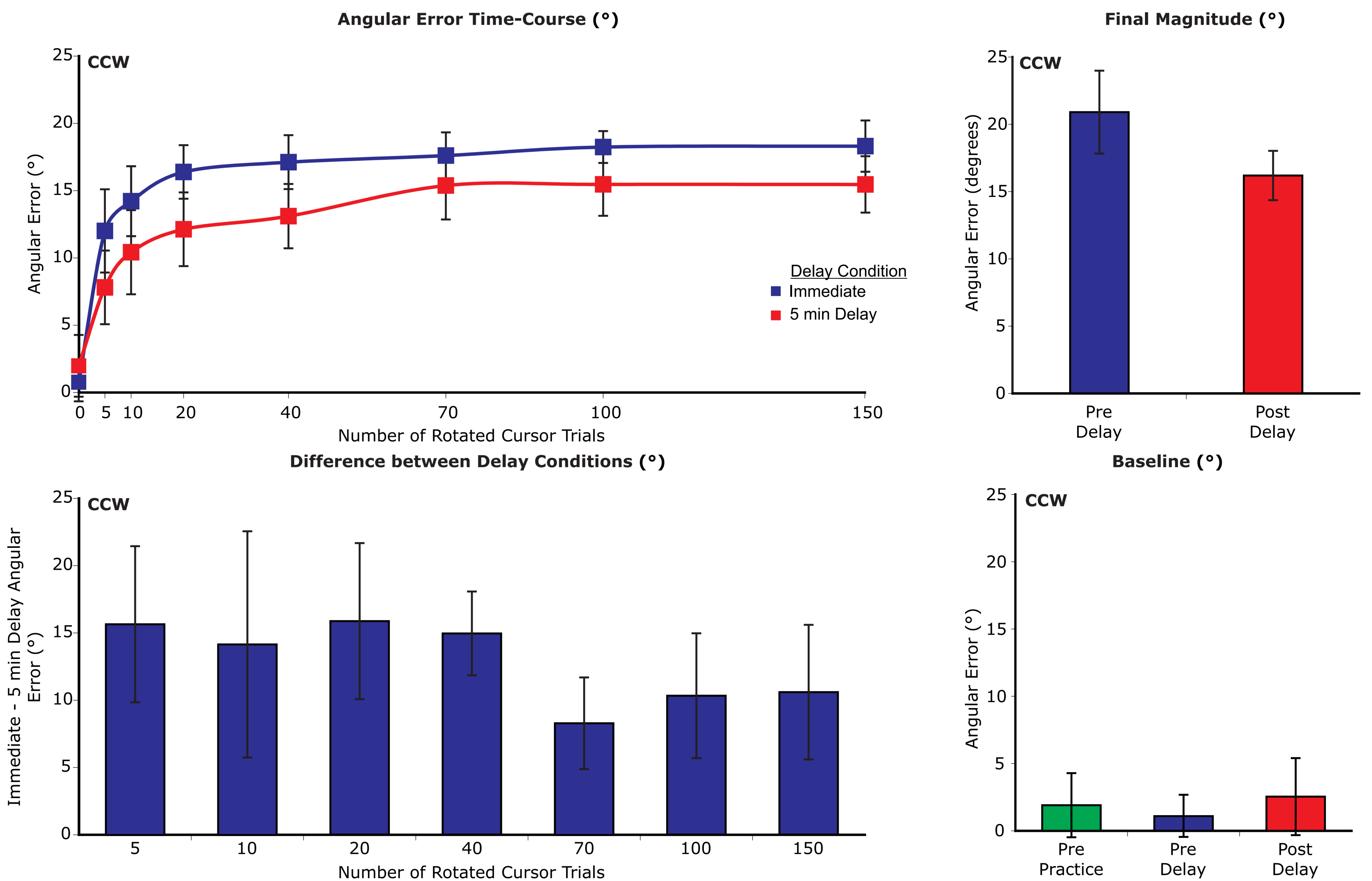
### Reach Aftereffect Task (no cursor feedback)



## EXPERIMENTAL DESIGN



## RESULTS



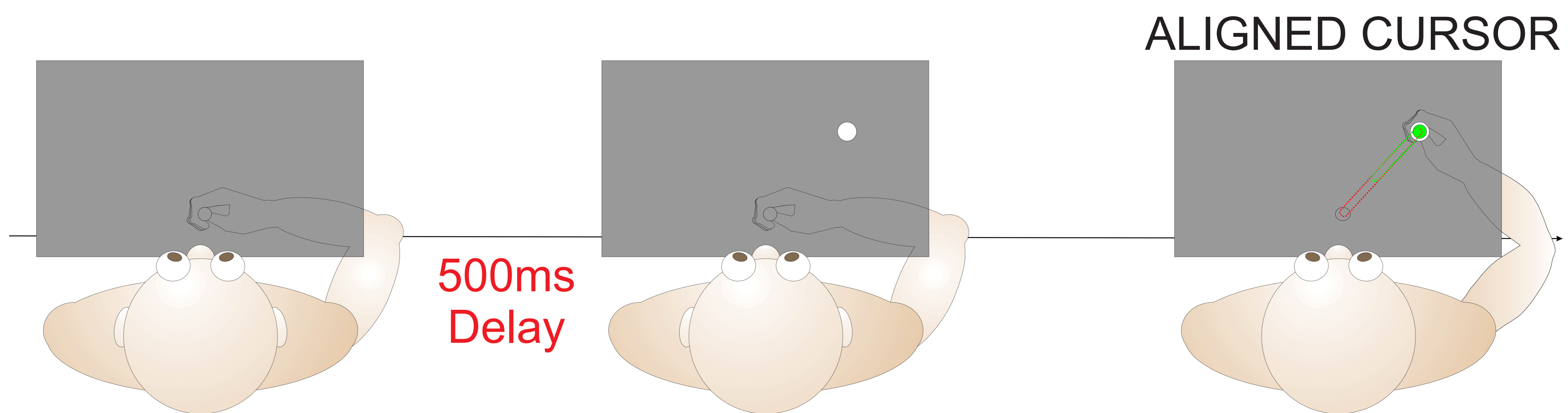
## DISCUSSION

- We see an increase in angular error in both Delay Conditions, with the Pre-Delay Condition showing consistently larger angular errors than the Post-Delay Condition.
- This decay in reach adaptation following only a five-minute delay suggests two separate adaptive mechanisms: a faster process that involves a temporary motor representation, and a slower process that involves a more permanent change in the motor system.
- This research suggests that motor performance immediately following training may be influenced by a temporary motor representation, rather than actual motor adaptation.
- Health professionals must therefore use rehabilitation interventions that involve a delayed assessment of motor performance following training in order to have a more accurate measure of motor learning.

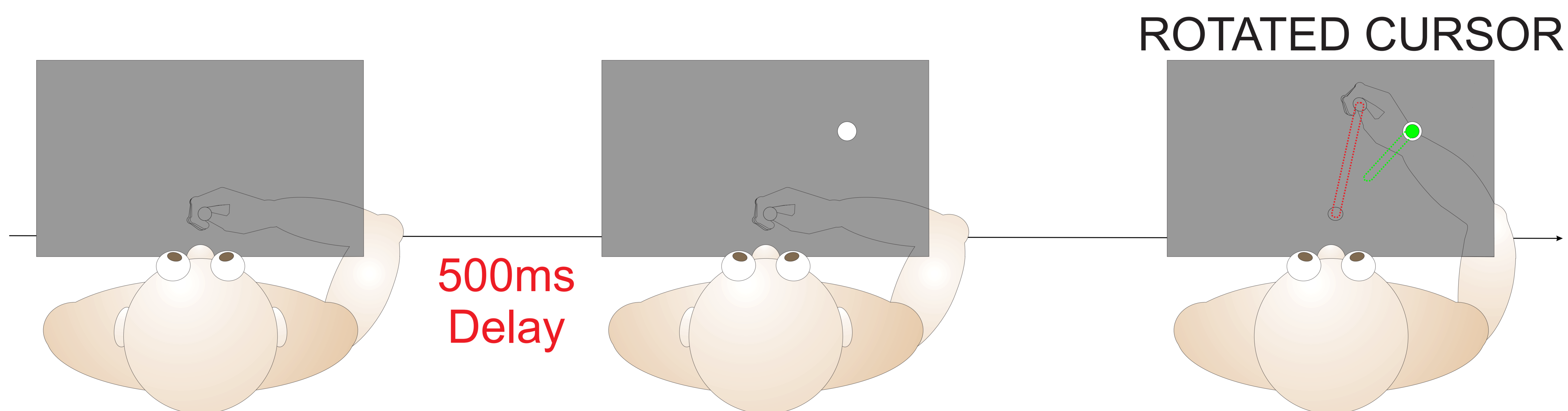
## REFERENCES



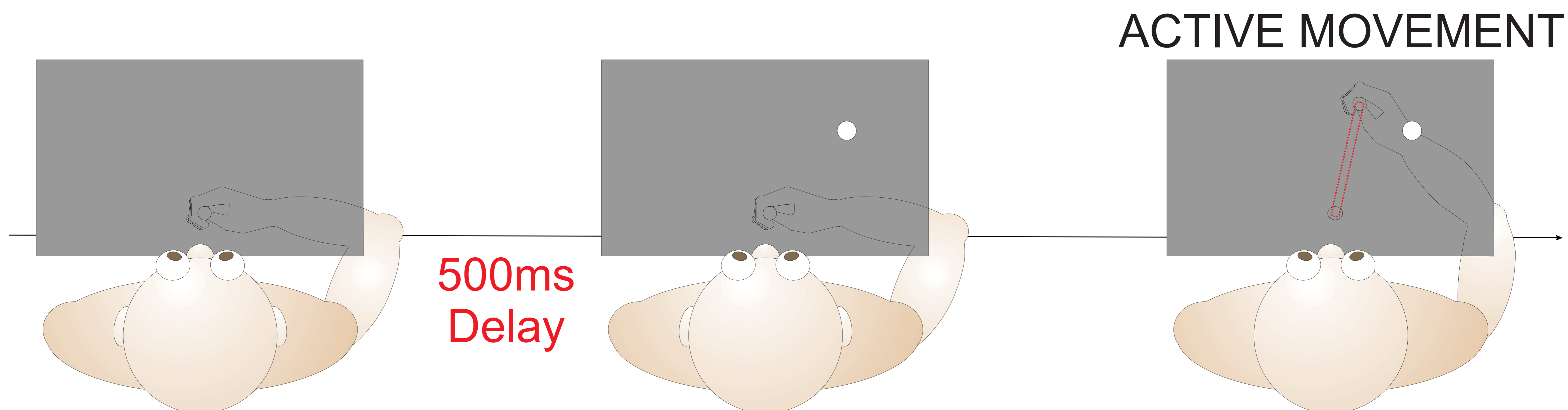
## Reach Training Task (cursor feedback)

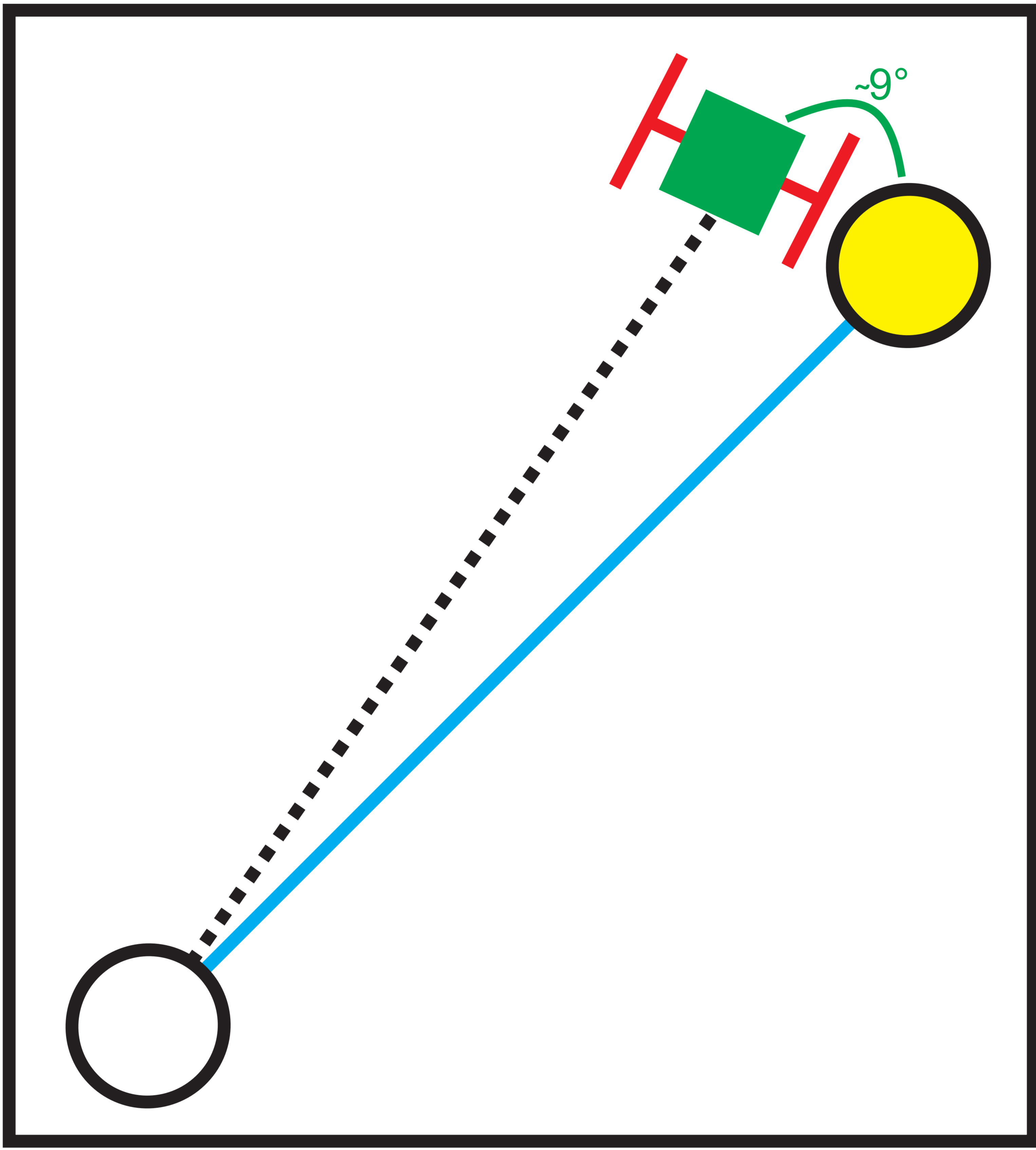


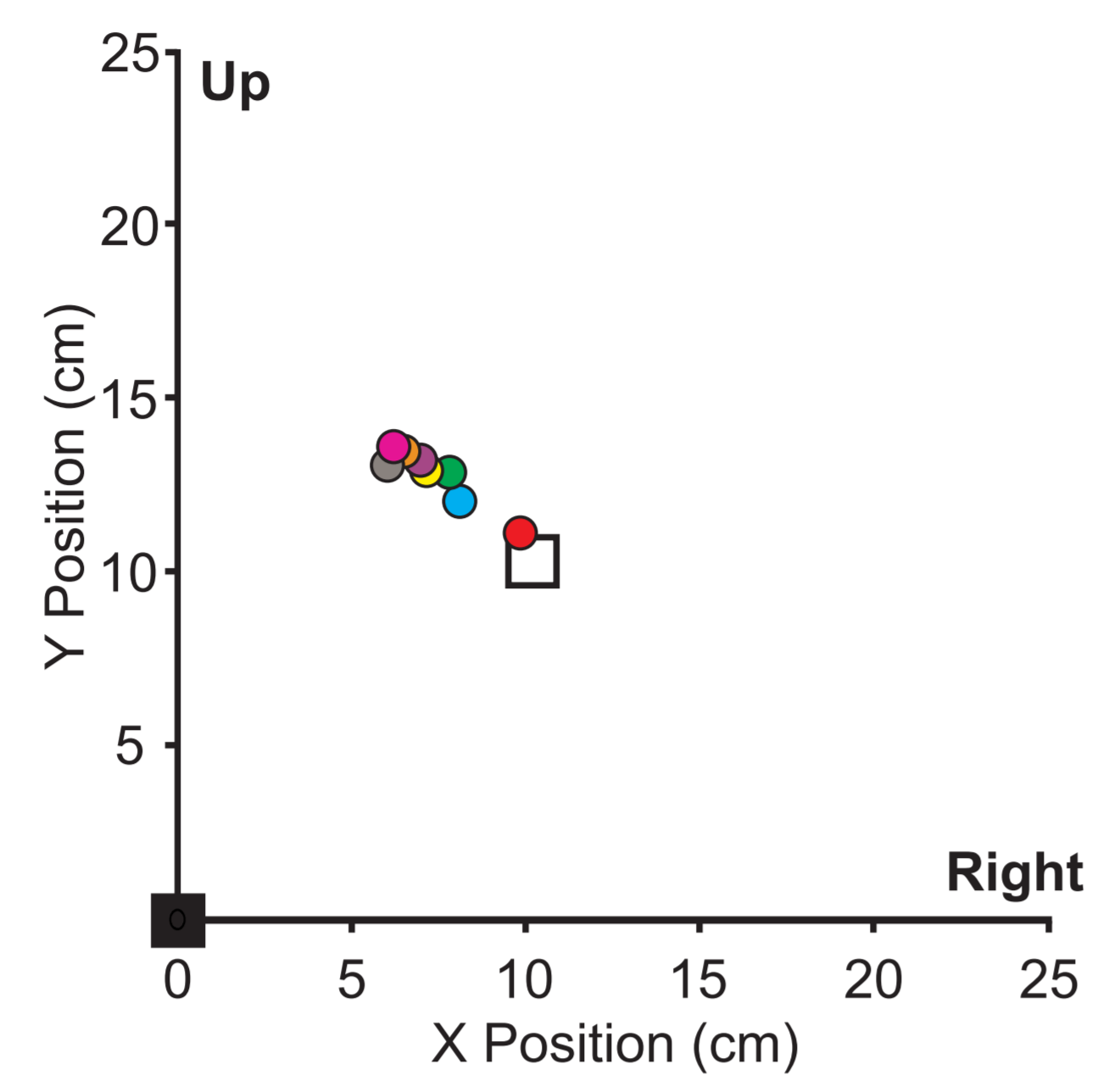
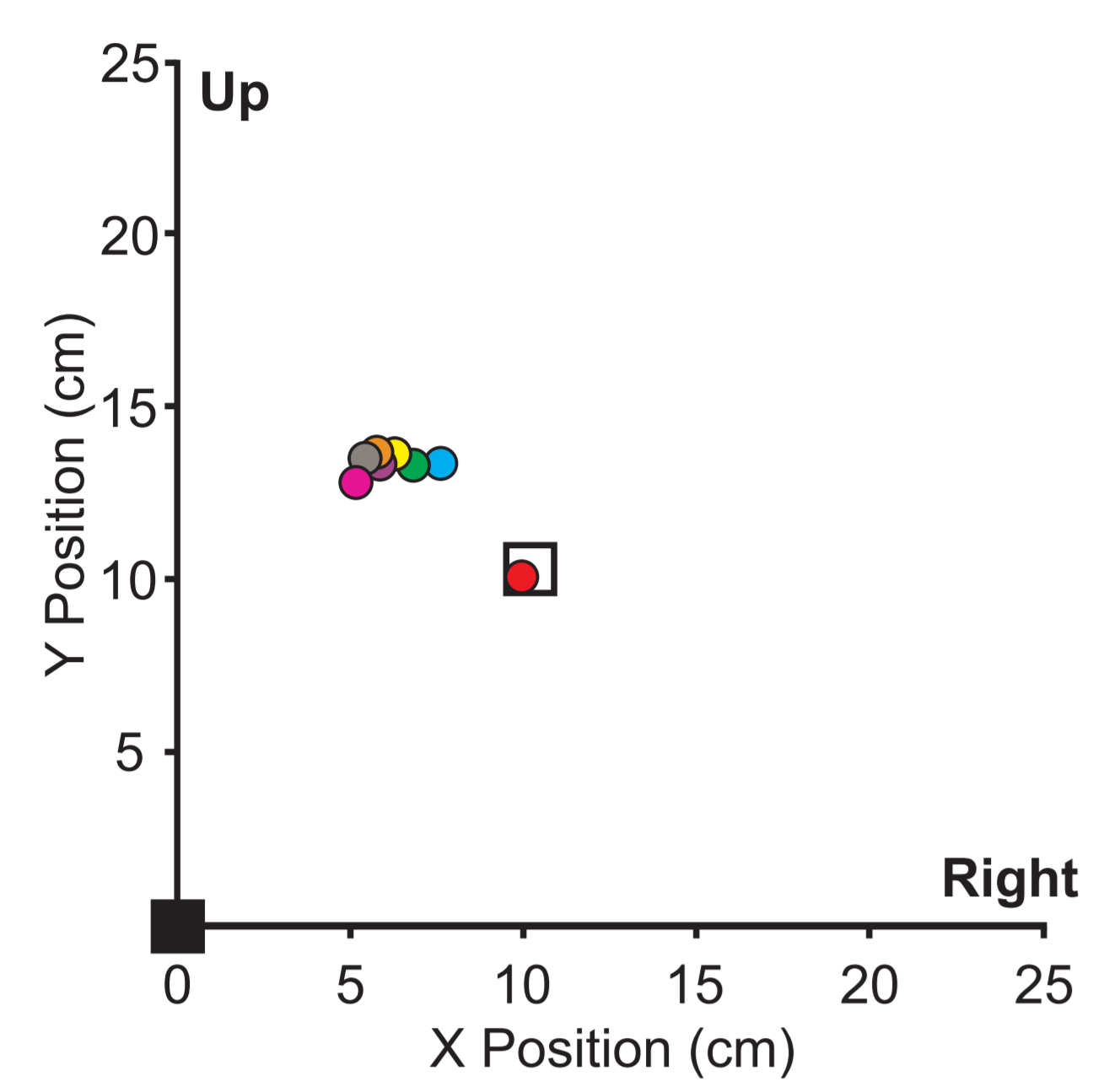
## Reach Training Task (cursor feedback)



## Reach Aftereffect Task (no cursor feedback)







### Proprioceptive Bias Endpoint Positions

