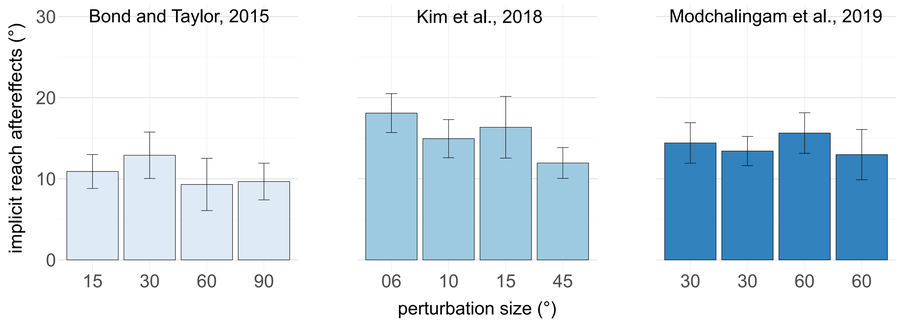
Unbounded Implicit Motor Adaptation

Shanaathanan Modchalingam, Marco Ciccone,
Bernard Marius 't Hart, & Denise Y. P. Henriques
Centre for Vision Research, York University, Toronto, ON, Canada

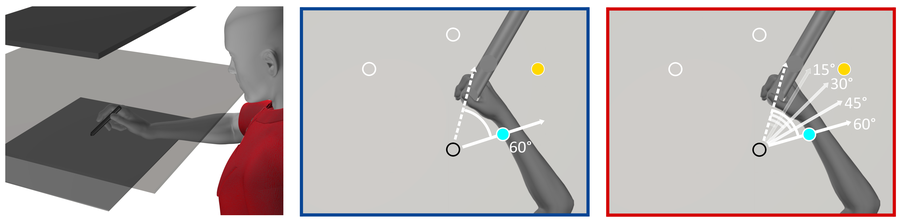
Implicit adaptation may have an upper boundary

When adapting reaches to counter a visual perturbation, this limit is fairly rigid and is not dependent on the size of the perturbation. With visuomotor rotations, the limit lies around 10-20 degrees.

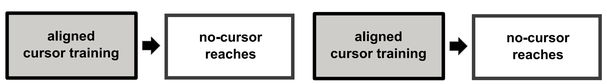


People reach to targets with a visually misaligned cursor

Abrupt experiment: Perturbation introduced abruptly; 25 participants
Stepwise experiment: Perturbation introduced stepwise; 37 participants

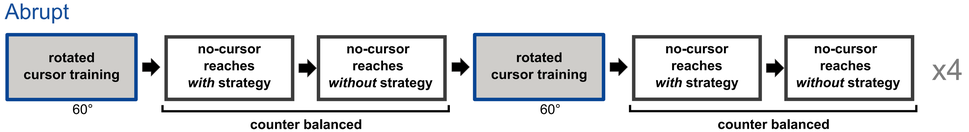


Aligned Phase

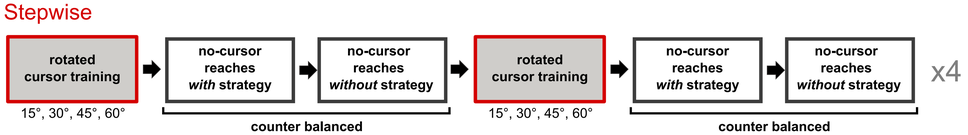


Rotated Phase

Abrupt

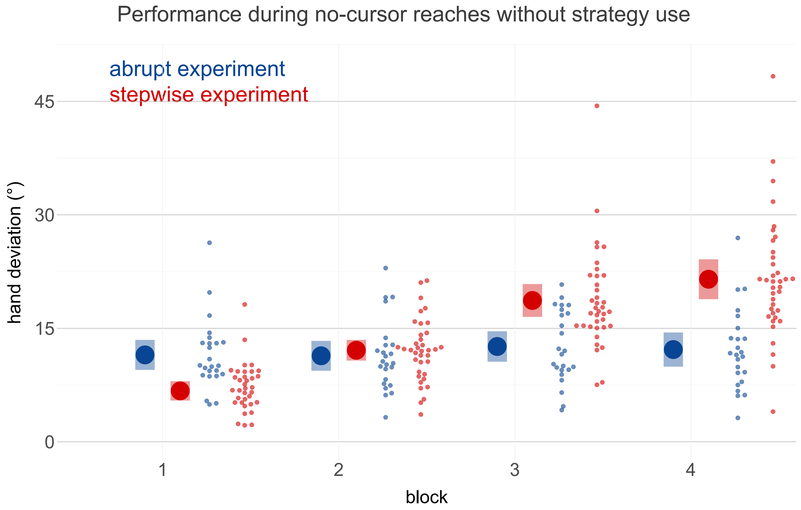


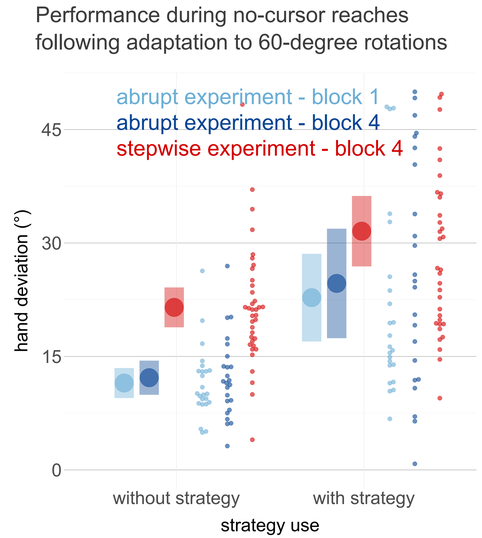
Stepwise



Introducing the perturbation stepwise led to increased implicit adaptation

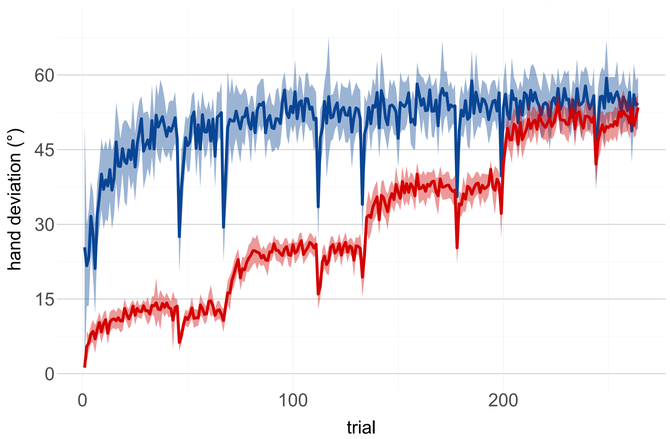
Participants that abruptly experienced the 60-degree rotation produced implicit aftereffects of ~15 degrees, in line with previous findings. However, adapting to smaller perturbations, and thus being exposed to smaller error signals, led to higher magnitudes of adaptation-dependent aftereffects.





Participants in both experiments adapted to the rotation

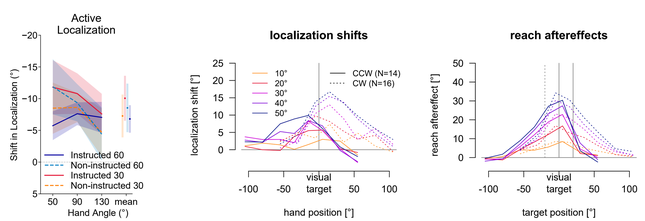
Participants in both experiments were able to counter a similar proportion of the 60-degree rotation at the end of training.



Small error signals may lead to implicit adaptation

Relevance estimation model - large errors may be discounted
Small errors may facilitate implicit motor adaptation

Possibly by increasing propriceptive recalibration
See poster 492.03 for more information



Contact:
s.modch@gmail.com
@modchalingam

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