# *Reward-Driven Motor Improvements are Resistant to Interference from Brain Stimulation, Drugs, Ageing and Disease*

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Skilled performance can be defined as a shift in the speed-accuracy trade-off

Improvement in skill
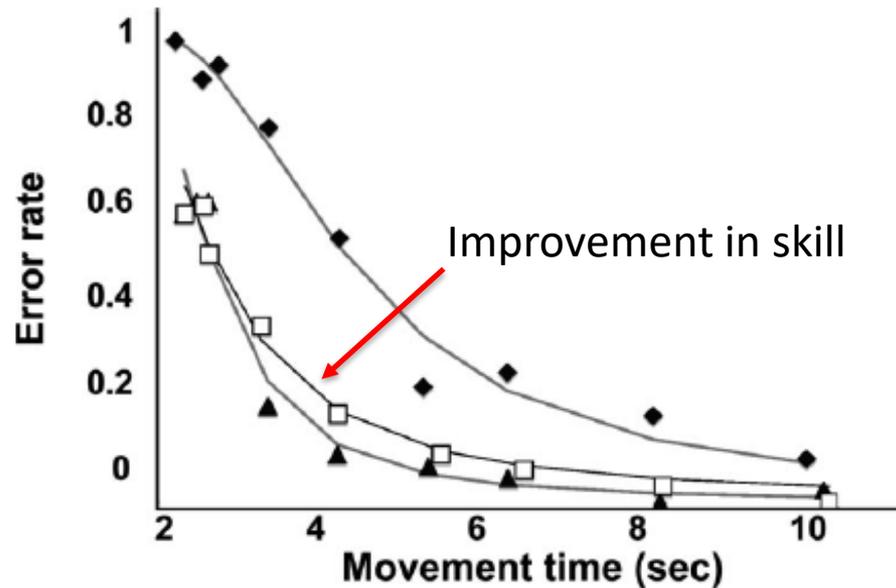
Noninvasive cortical stimulation enhances motor skill acquisition over multiple days through an effect on consolidation

Janine Reis[a,b], Heidi M. Schambra[a], Leonardo G. Cohen[a,1], Ethan R. Buch[a], Brita Fritsch[a,b], Eric Zarahn[c], Pablo A. Celnik[d,1,2], and John W. Krakauer[c,2]

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Reward has a powerful ability to break the speed-accuracy trade-off
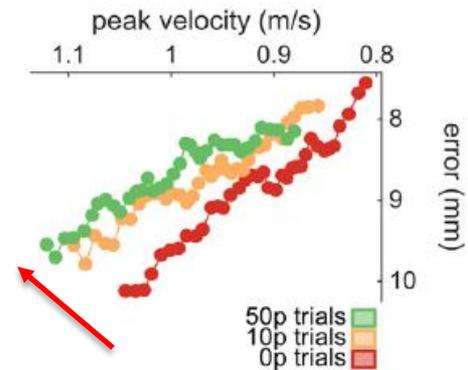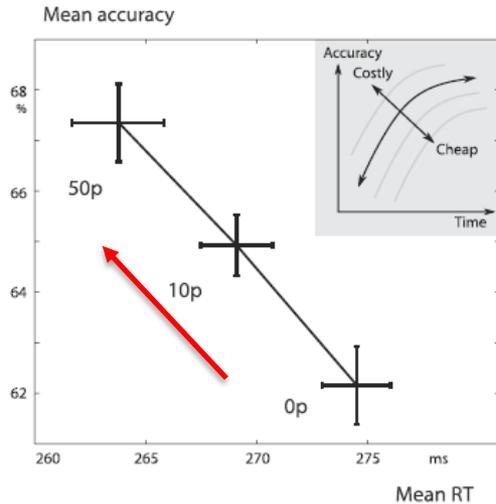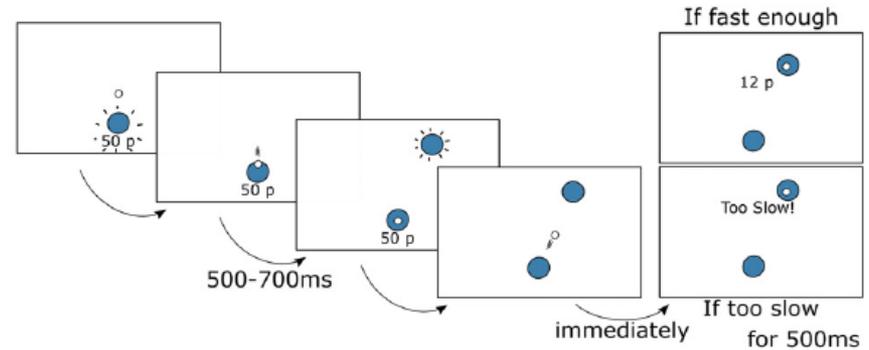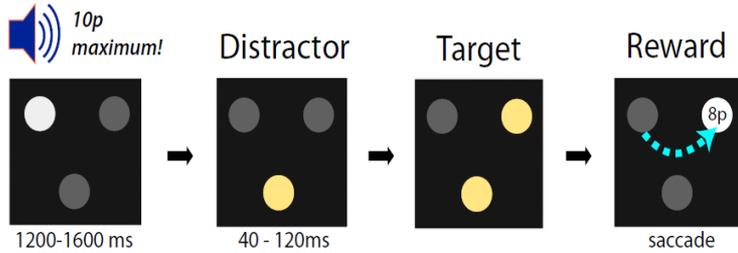
Manohar et al., 2015, Current Biology 25, 1707–1716

Reward-Based Improvements in Motor Control Are Driven by Multiple Error-Reducing Mechanisms

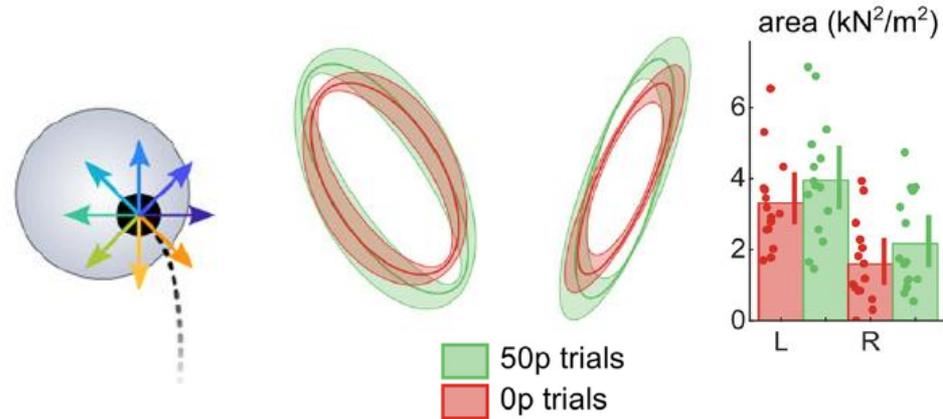Olivier Codol,[1] Peter J. Holland,[1] Sanjay G. Manohar,[2,3] and Joseph M. Galea[1]

Dr. Olivier Codol

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Why do we not always perform at this level? Reward pays the cost of enhanced performance

area (kN²/m²)

50p trials
0p trials

Reward is associated with cognitive and/or metabolically demanding noise reduction mechanisms (e.g. enhanced feedback correction and increased arm stiffness)
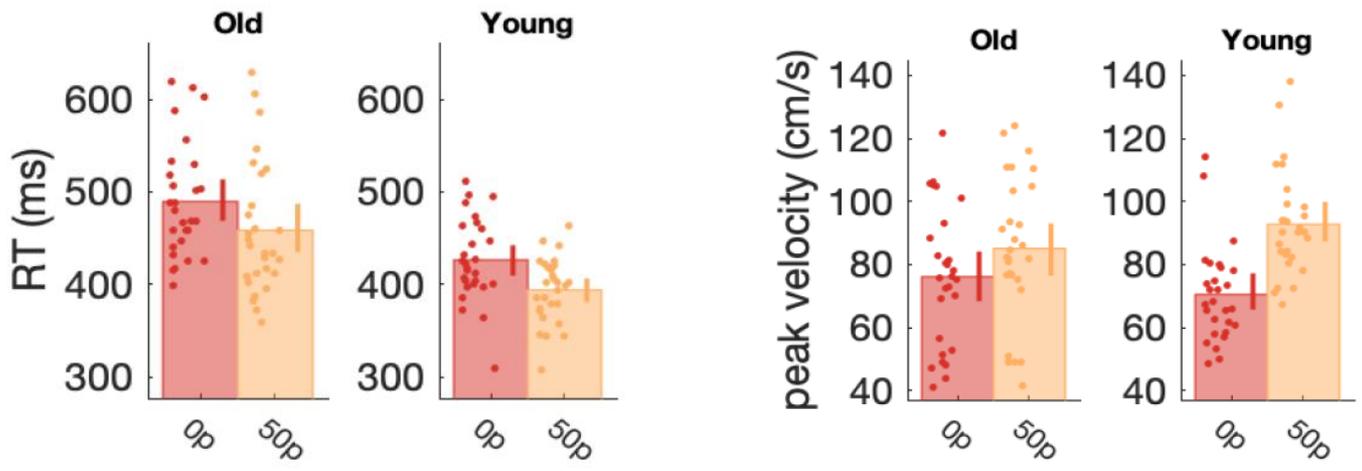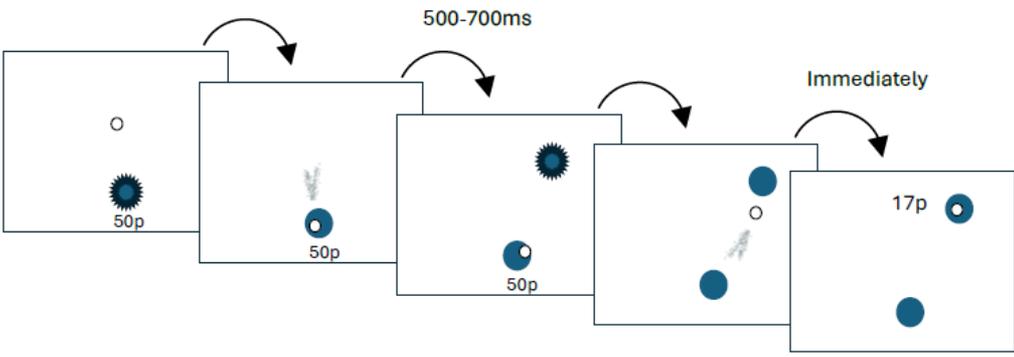
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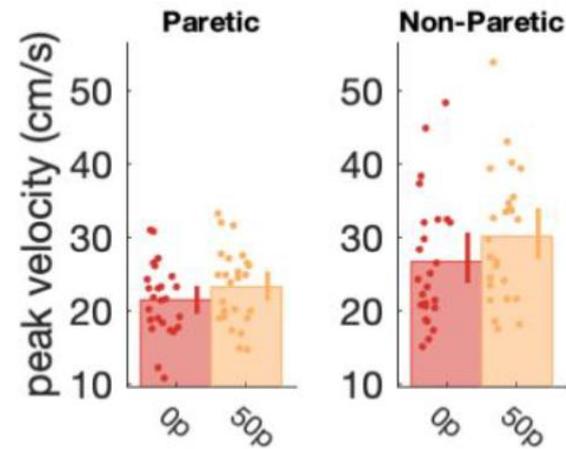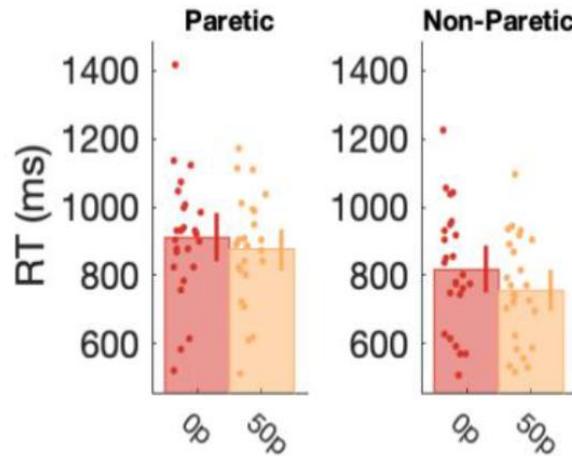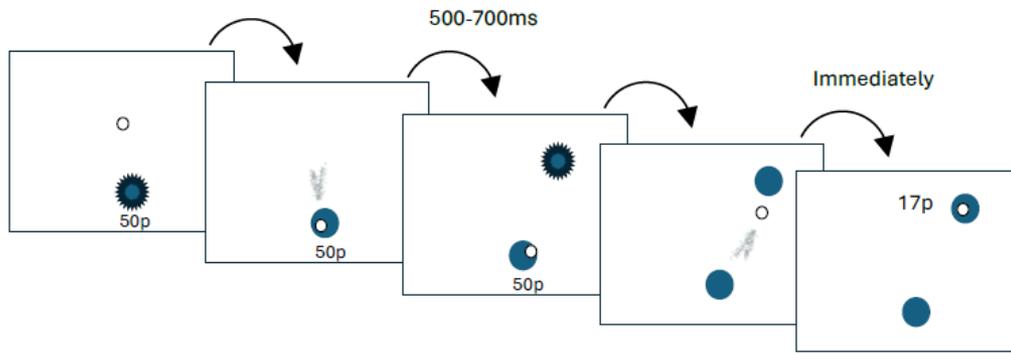Olivier Codol,[1] Peter J. Holland,[1] Sanjay G. Manohar,[2,3] and Joseph M. Galea[1]

Dr. Olivier Codol

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Reward based effects are robust in older adults

Dr. Ahmad Alghamdi

Reward based effects are robust in stroke patients

Dr. Ahmad Alghamdi