

# Body ownership acts (*per se*) on conscious awareness of willed actions

Lorenzo Pia

Symposium *Predicting myself and others: between sense of agency and body ownership*

XXIX Congresso Nazionale SIPF *Beyond the lockdown of the brain*  
Palermo, 30 Settembre - 2 Ottobre 2021



Psych Dep, Turin





SAMBA

SpAtial, Motor & Bodily Awareness





## Sensing the body, representing the body: Evidence from a neurologically based delusion of body ownership

Lorenzo Pia<sup>a,b</sup> , Francesca Garbarini<sup>a</sup> , Carlotta Fossataro<sup>a</sup> , Dalila Burin<sup>a</sup>  and Anna Berti<sup>a,b</sup> 

# Current Biology

Volume 23, Issue 2, 21 January 2013, Pages R57–R58



Correspondence

## Embodiment of an alien hand interferes with intact-hand movements

Francesca Garbarini<sup>1</sup>, Lorenzo Pia<sup>1,2</sup>, Alessandro Piedimonte<sup>1</sup>, Marco Rabuffetti<sup>3</sup>, Patrizia Gindri<sup>1,4</sup>, Anna Berti<sup>1,2</sup> 

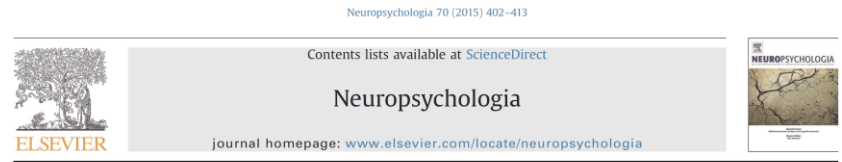
# SCIENTIFIC REPORTS

OPEN

## Bodily ownership modulation in defensive responses: physiological evidence in brain-damaged patients with pathological embodiment of other's body parts

Received: 04 December 2015  
Accepted: 23 May 2016  
Published: 13 June 2016

C. Fossataro<sup>1</sup>, P. Gindri<sup>1,2</sup>, T. Mezzanato<sup>1</sup>, L. Pia<sup>1,4</sup> & F. Garbarini<sup>1,2</sup>



## When your arm becomes mine: Pathological embodiment of alien limbs using tools modulates own body representation<sup>☆</sup>

Francesca Garbarini<sup>a,b,\*</sup>, Carlotta Fossataro<sup>a</sup>, Anna Berti<sup>a,c</sup>, Patrizia Gindri<sup>a,b</sup>, Daniele Romano<sup>d,e</sup>, Lorenzo Pia<sup>a,c</sup>, Francesco della Gatta<sup>f</sup>, Angelo Maravita<sup>d,e</sup>, Marco Neppi-Modona<sup>a,c</sup>



 **frontiers**  
in Psychology

ORIGINAL RESEARCH  
published: 14 January 2016  
doi: 10.3389/fpsyg.2016.02726



## 'See Me, Feel Me': Prismatic Adaptation of an Alien Limb Ameliorates Spatial Neglect in a Patient Affected by Pathological Embodiment



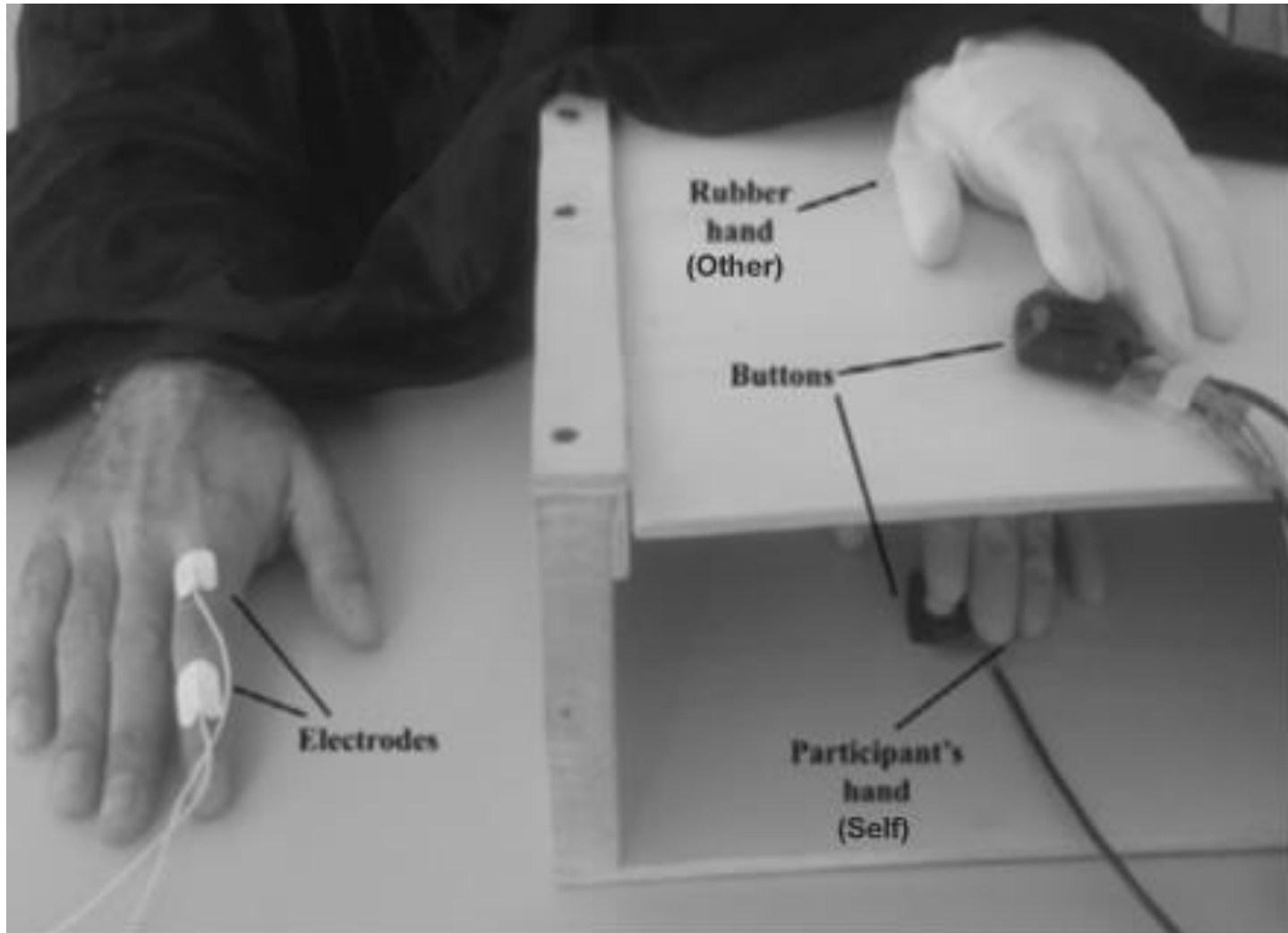


Original Articles

That's my hand! Therefore, that's my willed action: How body ownership acts upon conscious awareness of willed actions

Dalila Burin<sup>a</sup>, Maria Pyasik<sup>a</sup>, Adriana Salatino<sup>a,\*</sup>, Lorenzo Pia<sup>a,b,\*</sup>

<sup>a</sup>SAIRA (Spatial, Motor and Body Awareness) Research Group, Department of Psychology, University of Turin, Turin, Italy  
<sup>b</sup>NIJ (Neuroscience Institute of Turin), Turin, Italy



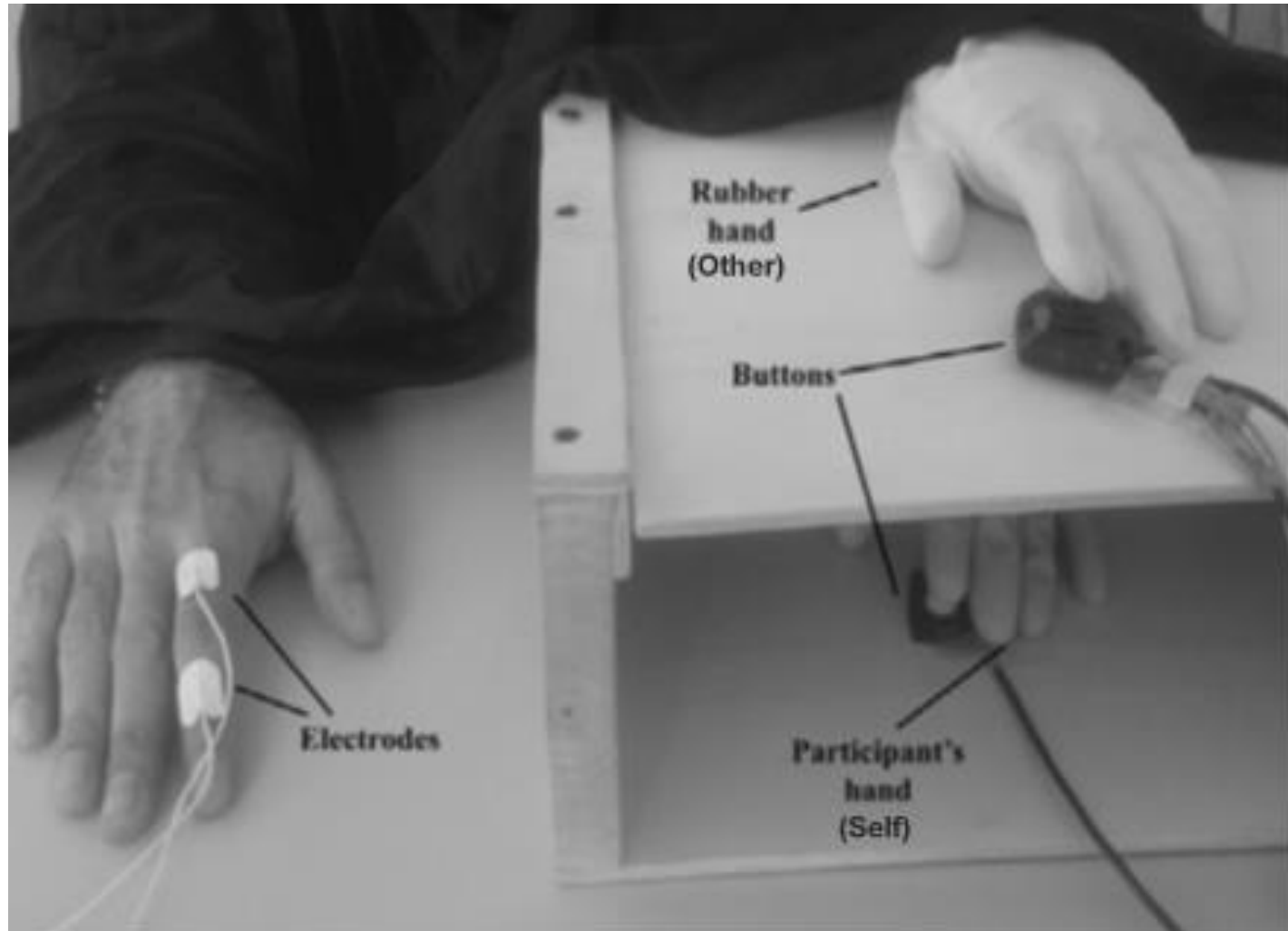
Self/Other/Sync (1min)/Async (1min)

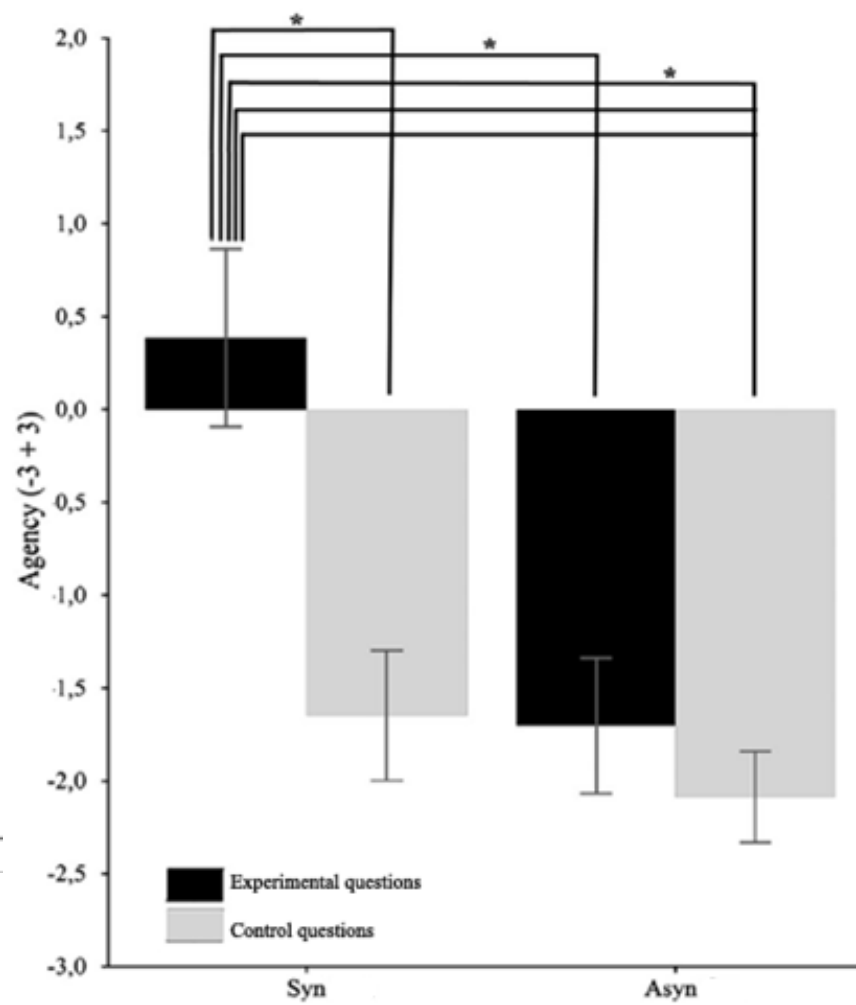
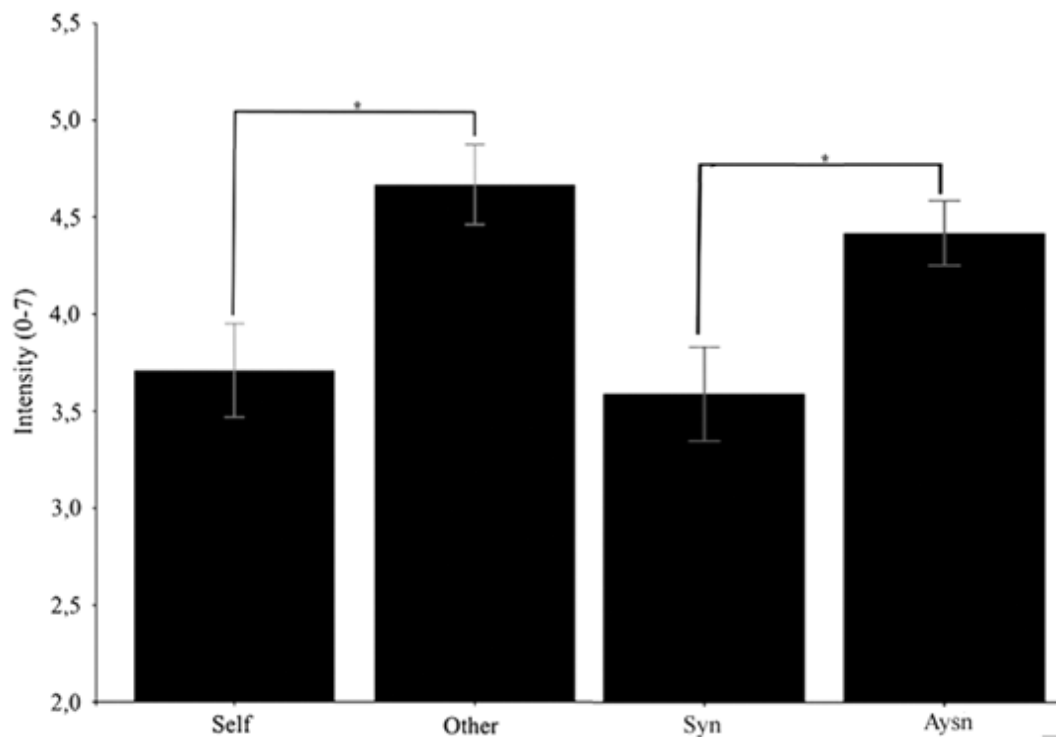
Button press

Electrical stimulation

Intensity rating (0-7 Likert)

Agency Quest. (e.g., 'felt as if I was causing the movement') on -3+3 Likert







Contents lists available at [ScienceDirect](#)

## Consciousness and Cognition

journal homepage: [www.elsevier.com/locate/concog](http://www.elsevier.com/locate/concog)

### “As long as that is my hand, that willed action is mine”: Timing of agency triggered by body ownership

Dalila Burin<sup>a</sup>, Maria Pyasik<sup>b</sup>, Irene Ronga<sup>b</sup>, Marco Cavallo<sup>d</sup>, Adriana Salatino<sup>b,\*</sup>, Lorenzo Pia<sup>b,c</sup>




*Social Cognitive and Affective Neuroscience*, 2019, 119–127

doi: [10.1093/scan/nsz002](https://doi.org/10.1093/scan/nsz002)

Advance Access Publication Date: 15 January 2019

Original article

## Shared neurocognitive mechanisms of attenuating self-touch and illusory self-touch

Maria Pyasik,<sup>1,†</sup> Adriana Salatino,<sup>1,†</sup> Dalila Burin,<sup>2</sup> Anna Berti,<sup>1,3</sup> Raffaella Ricci,<sup>1,3</sup> and Lorenzo Pia<sup>1,3</sup>



Contents lists available at [ScienceDirect](#)

## NeuroImage

journal homepage: [www.elsevier.com/locate/neuroimage](http://www.elsevier.com/locate/neuroimage)



### I’m a believer: Illusory self-generated touch elicits sensory attenuation and somatosensory evoked potentials similar to the real self-touch

Maria Pyasik<sup>a,b,#</sup>, Irene Ronga<sup>c,#</sup>, Dalila Burin<sup>d</sup>, Adriana Salatino<sup>a</sup>, Pietro Sarasso<sup>a</sup>, Francesca Garbarini<sup>c</sup>, Raffaella Ricci<sup>a,e</sup>, Lorenzo Pia<sup>a,e,\*</sup>



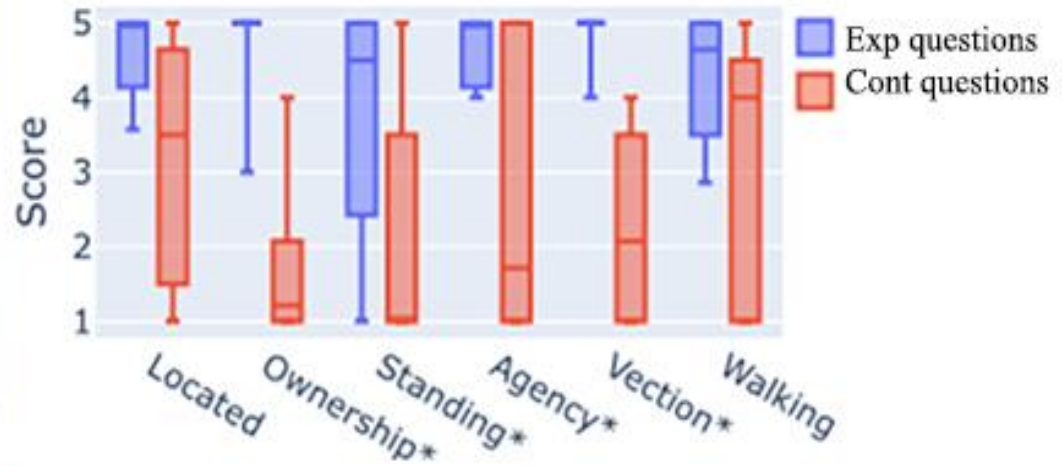


## Using Body Ownership to Modulate the Motor System in Stroke Patients

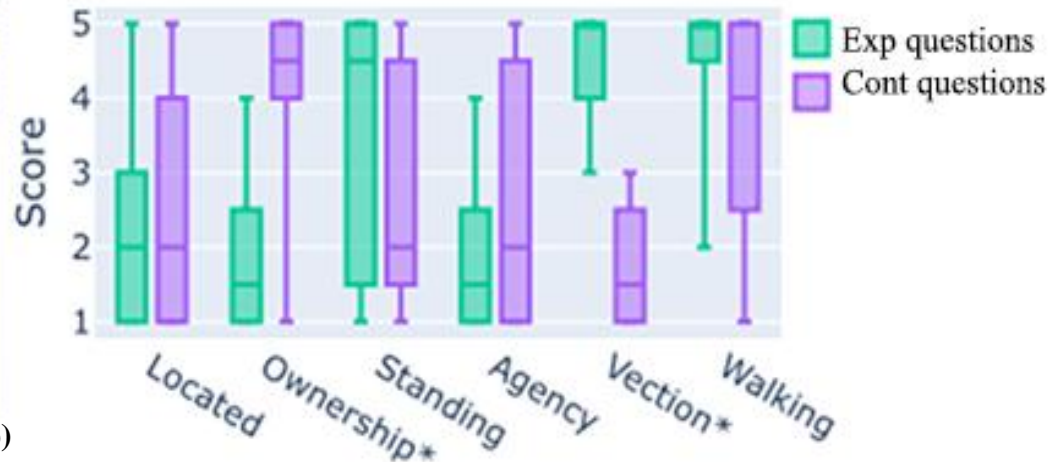
Riccardo Tambone<sup>1</sup>, Alberto Giachero<sup>2</sup>, Melanie Calati<sup>2</sup>,  
Maria Teresa Molo<sup>2</sup>, Dalila Burin<sup>3</sup>, Maria Pyasik<sup>1,4</sup>,  
Francesca Cabria<sup>1</sup>, and Lorenzo Pia<sup>1,5</sup>



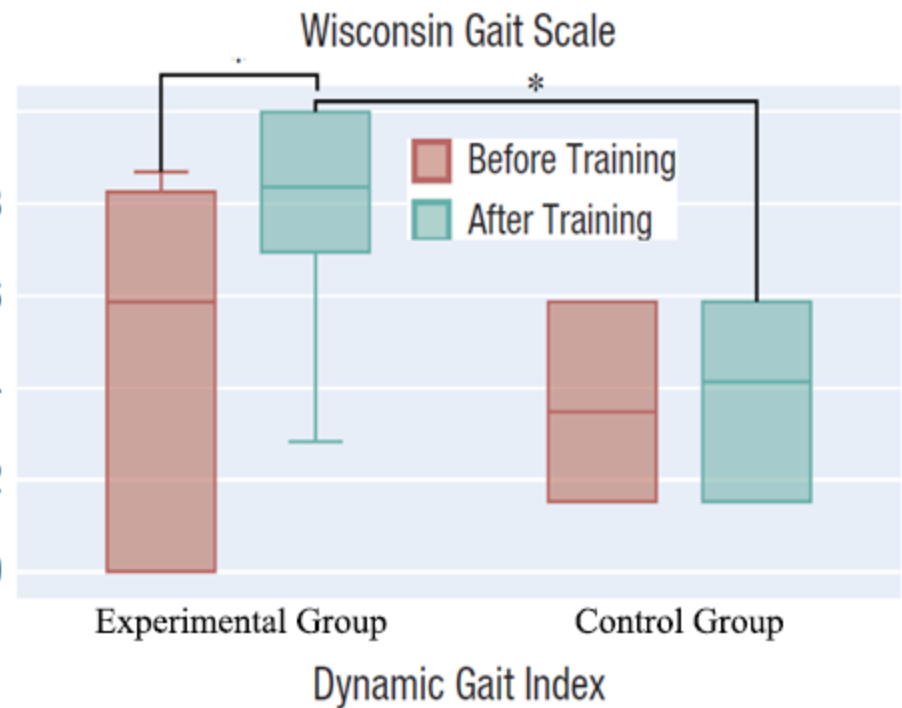
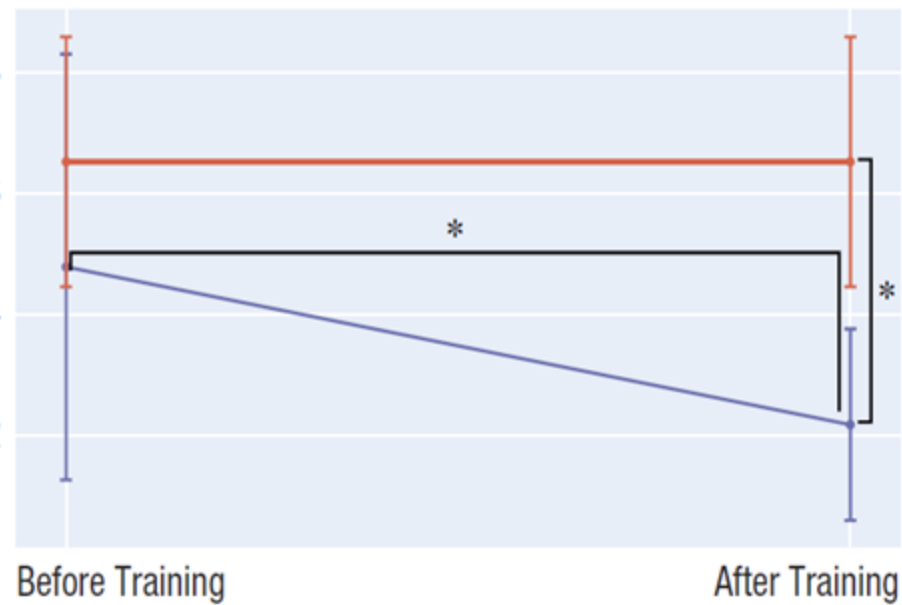
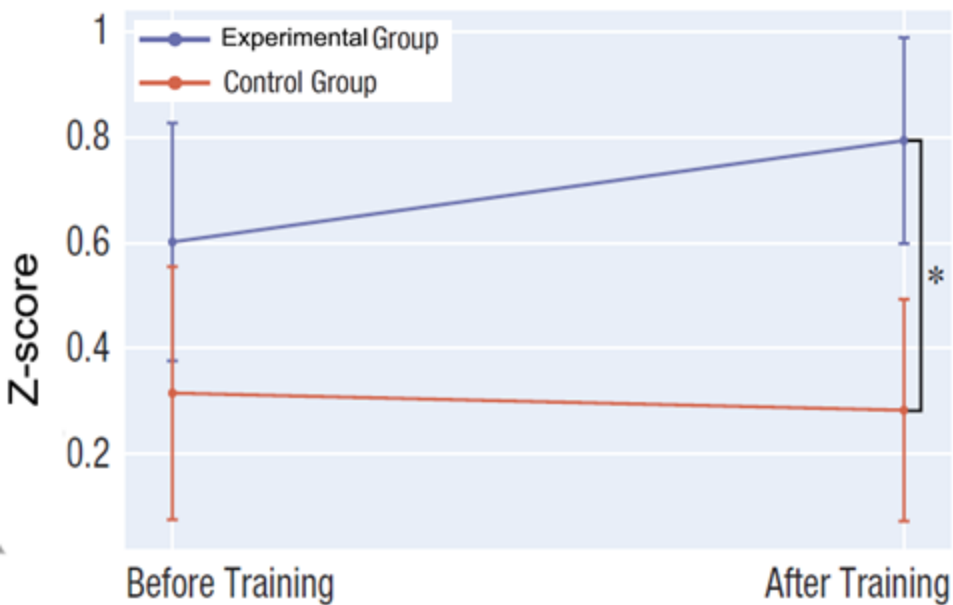
First person perspective (Exp Group)



Third person perspective (Control Group)

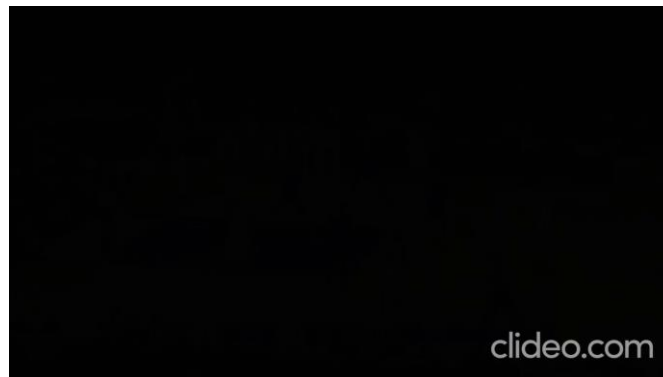






# DISCUSSION

- BO acts *per se* (no efferences) on SOA
- (Apparent) desired bodily state activates the action flow
- Bo guarantee access to motor system if forward mechanisms are deteriorated (e.g., motor deficits) or forward information poor



**THANKS FOR YOUR ATTENTION!!!!!!**