



**UNIVERSITÀ  
DEGLI STUDI  
DI UDINE**



# **Neuropsicologia del Disturbo dell'Immagine Corporea**

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# **“All over the world, self begins with body”**

(Baumeister, RF, 1999. The Self in Social Psychology. Psychology Press /Taylor & Francis)



# Le Rappresentazioni Neurali del Corpo

L'a rappresentazione del corpo è un costrutto complesso che include rappresentazioni percettive, motorie, cognitive, emotive, concettuali e spirituali del proprio e altrui corpo.

*Berlucchi & Aglioti, 1997; 2010*

# Se' e Corpo

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(Baumeister, RF, 1999. The Self in Social Psychology. Psychology Press /Taylor & Francis)



Riconoscimento visivo del proprio e altrui corpo/volto

*immagine corporea*: conoscenza più esplicita, cosciente della morfologia del nostro corpo.



Senso di appartenenza del proprio corpo

*schema corporeo*: mappa inconscia, costantemente aggiornata dalle afferenze periferiche, che permette di localizzare le parti del corpo in vista dell'azione

# Se' e Corpo

**“All over the world, self begins with body”**

(Baumeister, RF, 1999. The Self in Social Psychology. Psychology Press /Taylor & Francis)



**Riconoscimento visivo del proprio e altrui corpo/volto**



Senso di appartenenza del proprio corpo



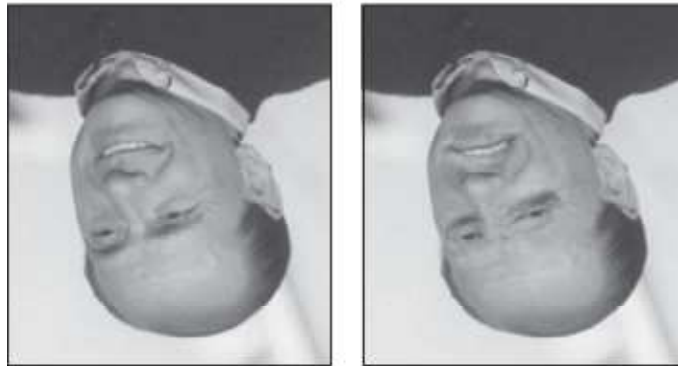
## Riconoscimento Visivo



Il Riconoscimento visivo del proprio corpo e volto, già presente nei primi mesi di vita e nei primati non umani (*Anderson, 1984; Gallup, 1982*)



# Le facce nel cervello



**Effetto di Inversione**

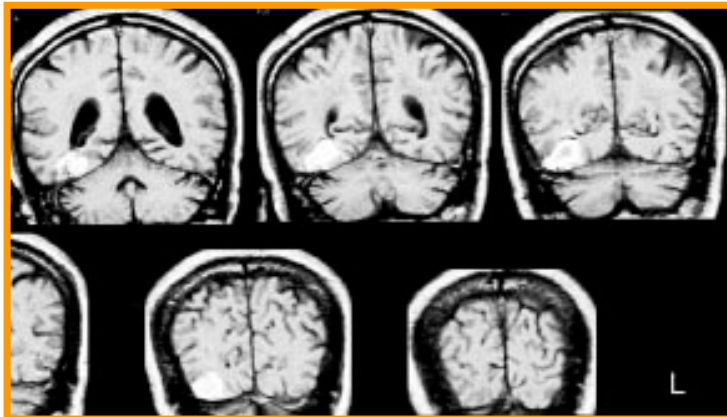
# Le facce nel cervello



**Effetto di Inversione**

## Prosopagnosia

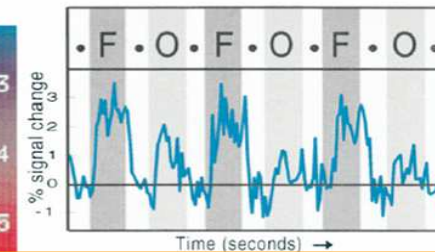
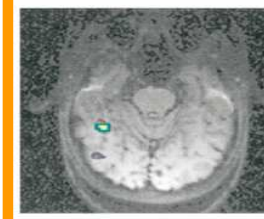
Incapacità selettiva nel riconoscimento di volti con preservato riconoscimento di altri oggetti.



## Area occipitale e fusiforme per le facce (OFA & FFA)

Attivazione selettiva alla presentazione visiva di volti (Kanwisher et al., 1997)

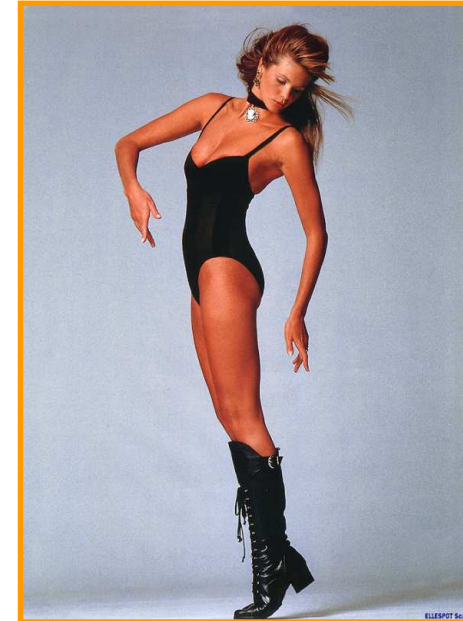
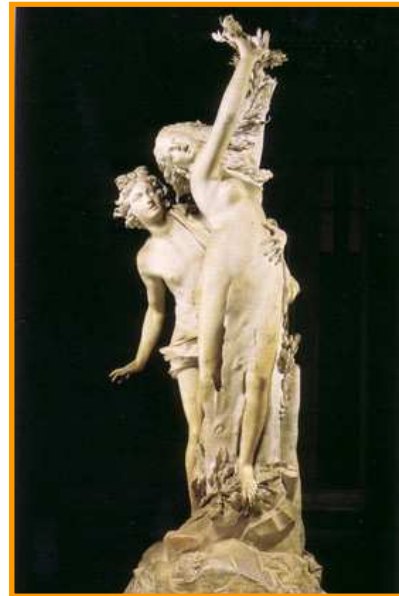
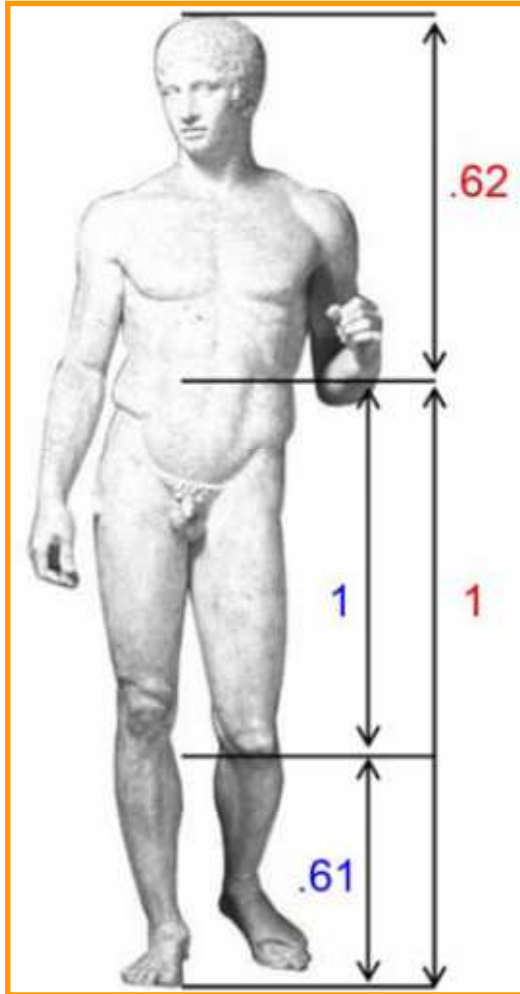
1a. Faces > Objects



1b. Objects > Faces



# E il Corpo?



Estetica, Arte e Moda

# E il Corpo?



Disturbi neurologici  
dell'immagine corporea  
(micro- o macro-  
somatognosie)



Disturbi psichiatrici  
dell'immagine corporea

# Il corpo nel cervello

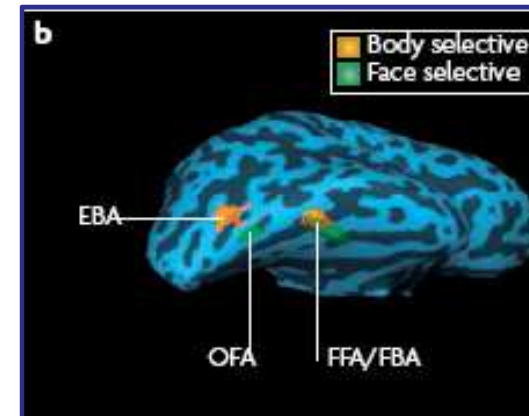
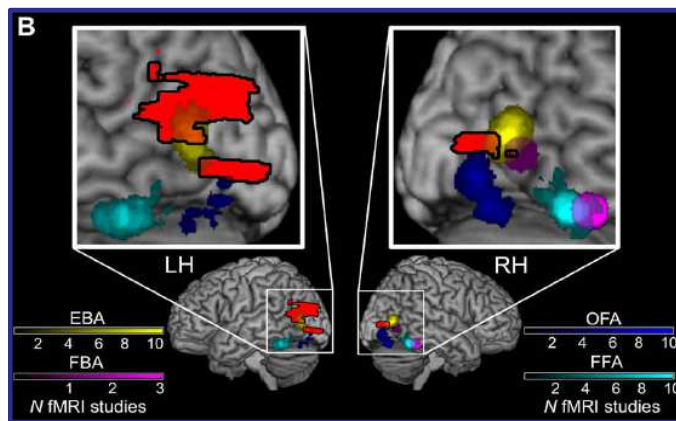


Effetto di Inversione

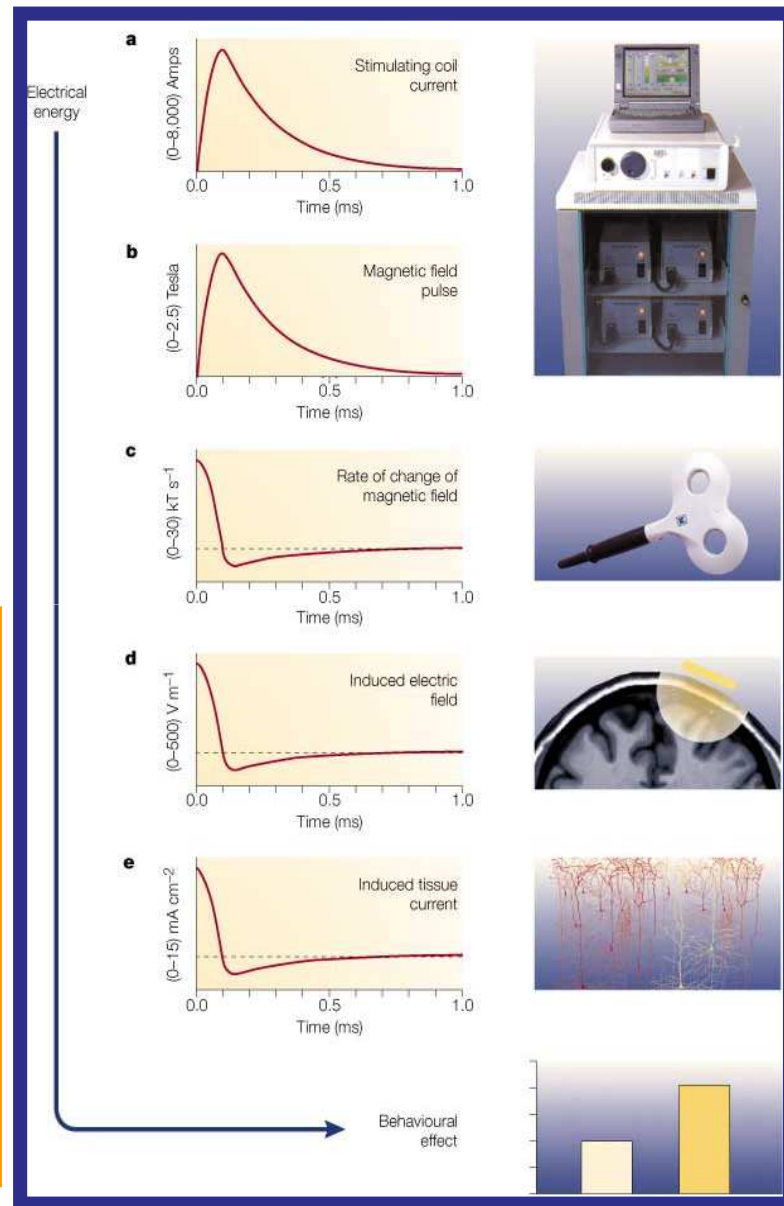


**Agnosia per il corpo**  
(Moro et al., Neuron, 2008).

**Area extrastriata  
(EBA & FBA)**  
(Downing et al., 2001)

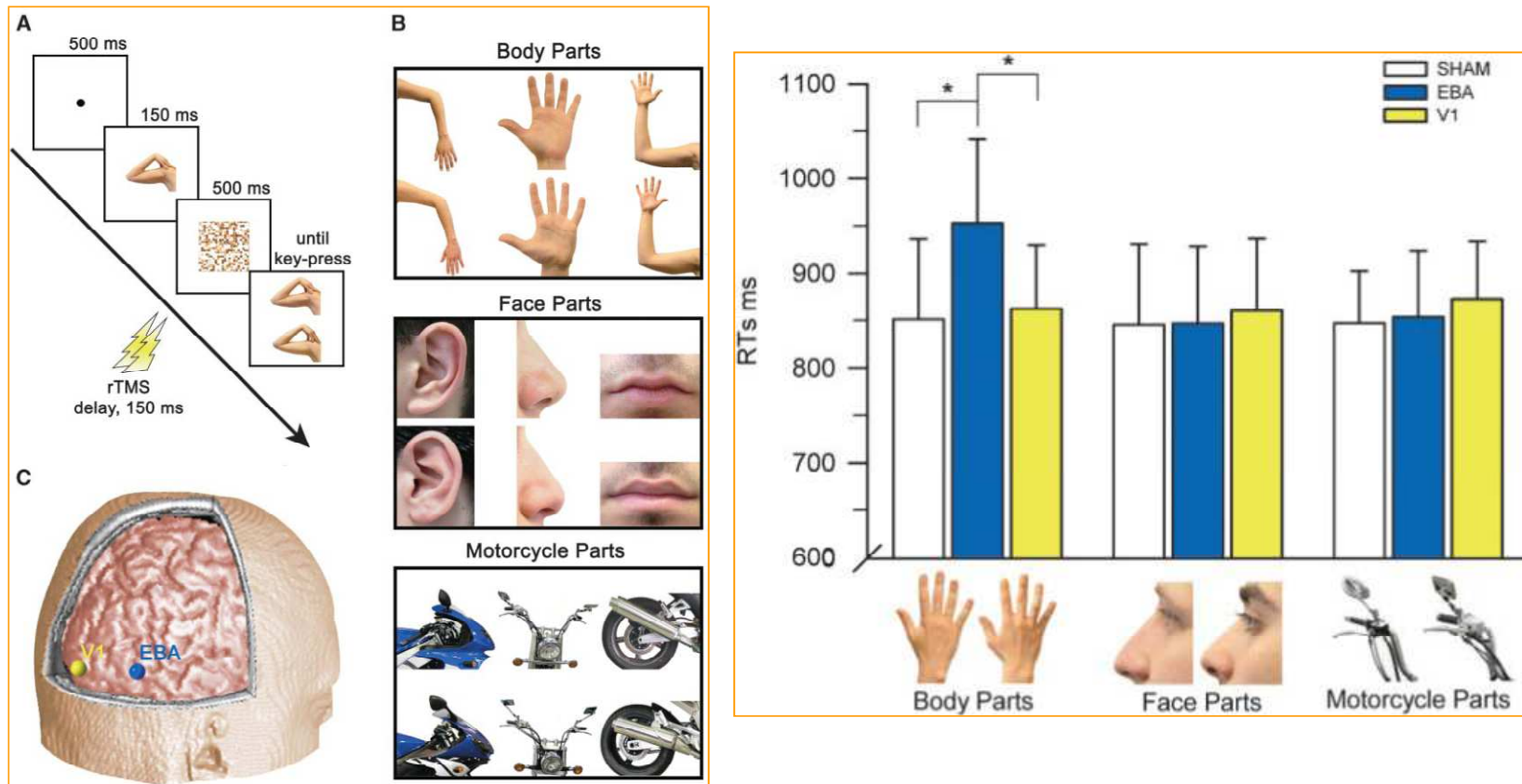


# Transcranial Magnetic Stimulation (TMS)



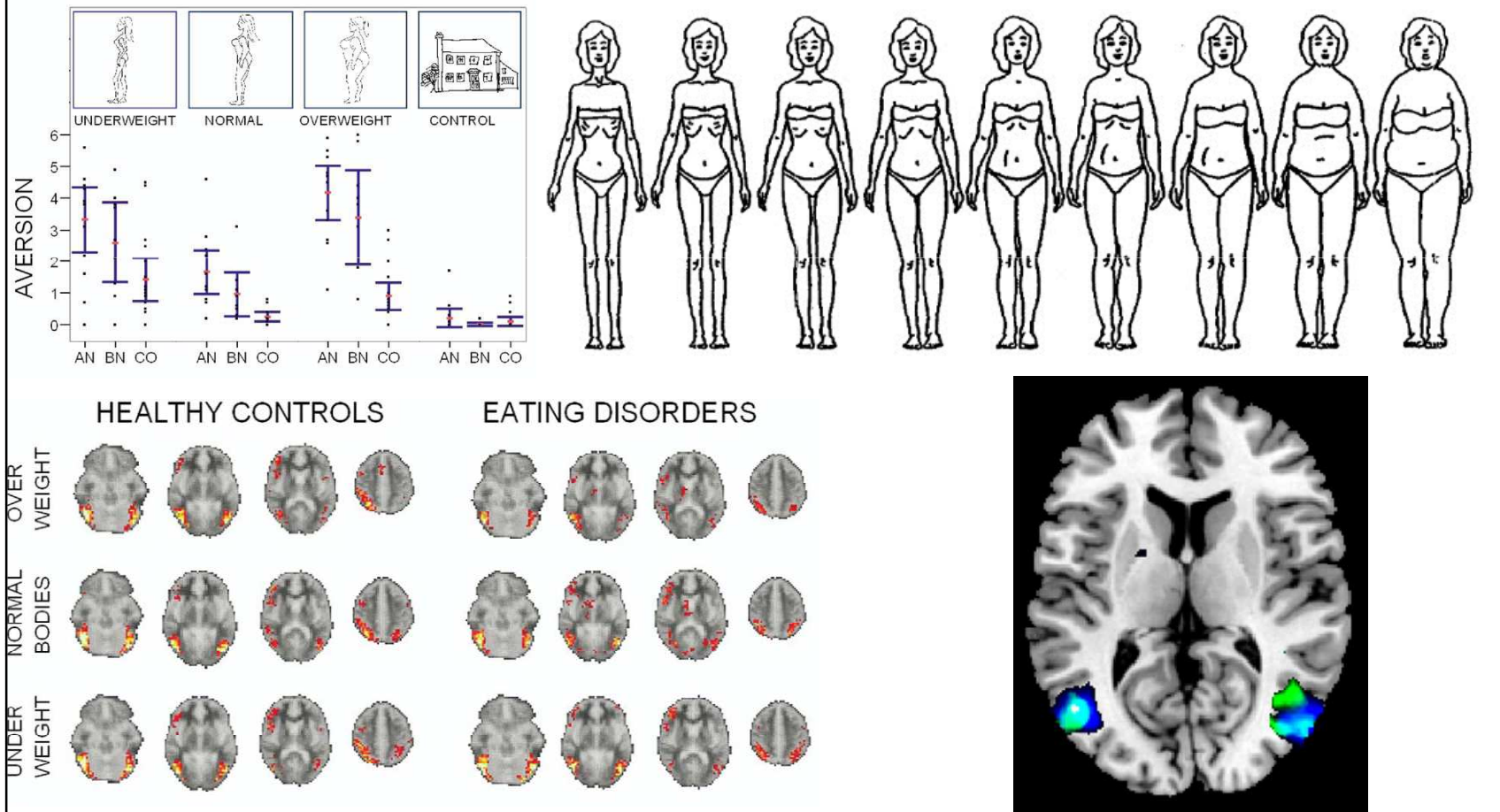
## Magnetic Stimulation of Extrastriate Body Area Impairs Visual Processing of Nonfacial Body Parts

*Urgesi, Berlucchi, Aglioti (2004) Current Biology, 14: 2130-2134*



# Anoressia e EBA?

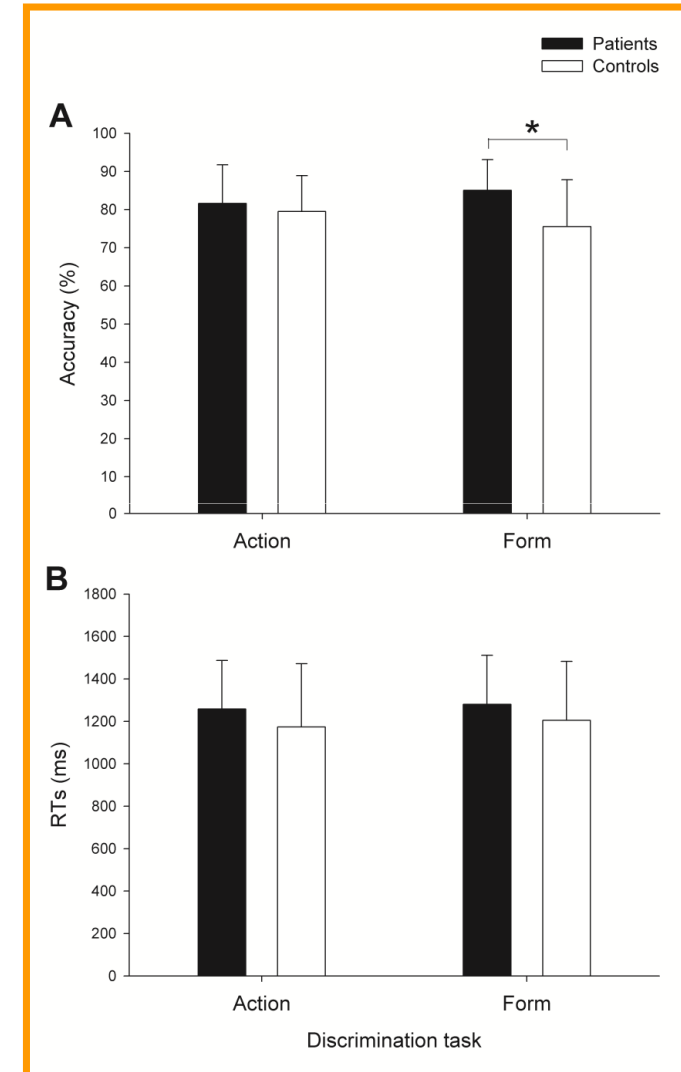
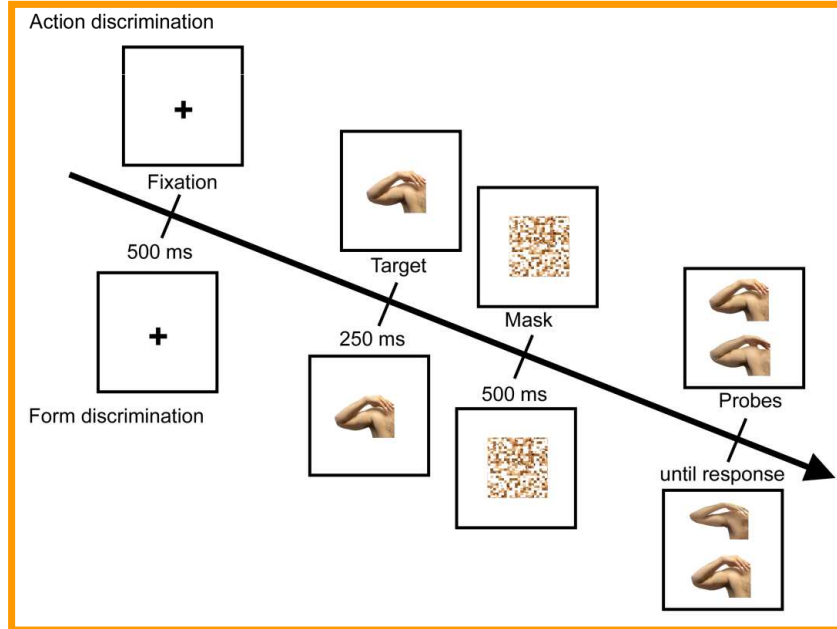
Alterazioni funzionali (*Uher et al., Biol Psychiatry, 2005*) e strutturali (riduzione densità della sostanza grigia; *Suchan et al., Beh Brain Res, 2010*) nell'AN.



# Percezione Visiva del Corpo e Anoressia Nervosa

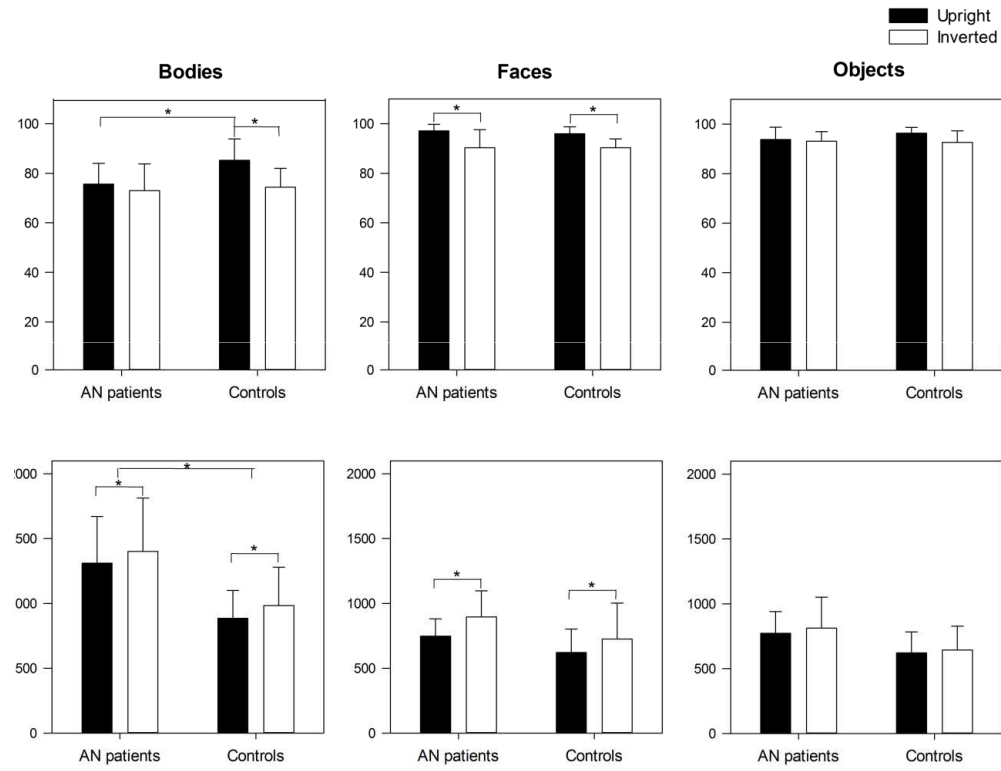
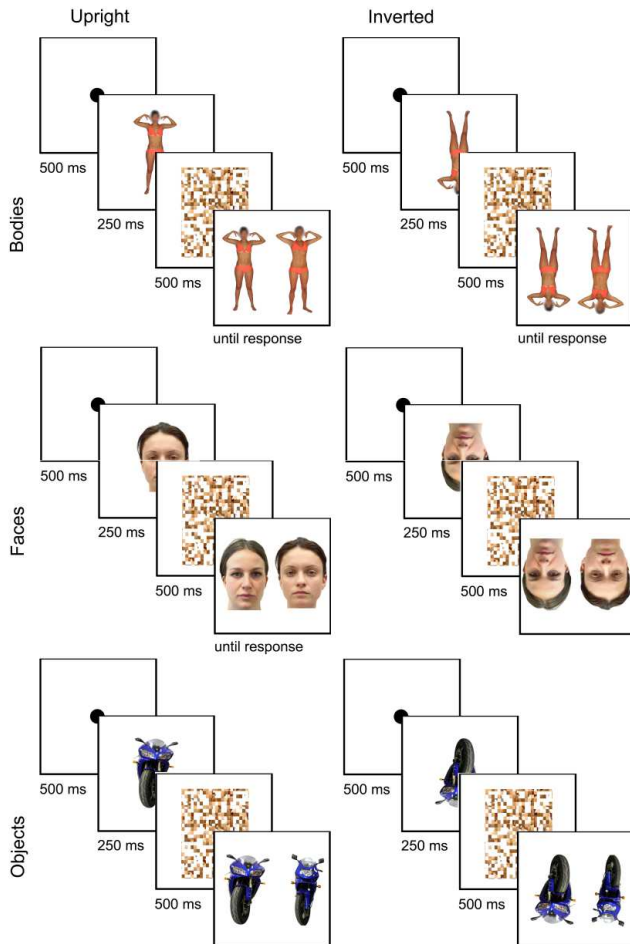
Table 1 Demographic information of patients and age matched controls.

	Patients Mean (S.D.)	Controls Mean (S.D.)	Patients vs. controls
Sample size	15	15	-
Age (years)	15.5 (1.2)	15.4 (1.2)	$t_{28} = 0.15, P = 0.882$
Education (years)	9.9 (1.1)	9.9 (1.2)	$t_{28} = 0, P = 1$
IQ (percentile rank)	92.9 (13.6)	87.5 (12.4)	$t_{28} = 1.15, P = 0.258$
BMI (kg/m <sup>2</sup> )	17 (1.1)	20.64 (2)	$t_{28} = -6.17, P < 0.001$
Age at onset (years)	14 (1.3)	-	-
Duration of illness (months)	18.5 (14.2)	-	-
SES Education	11.8 (4.2)	11.1 (4.5)	$t_{28} = 0.44, P = 0.661$
SES Occupation	26 (11.9)	24.8 (9.1)	$t_{28} = 0.3, P = 0.765$



Urgesi et al., *International Journal of Eating Disorders*, 2013

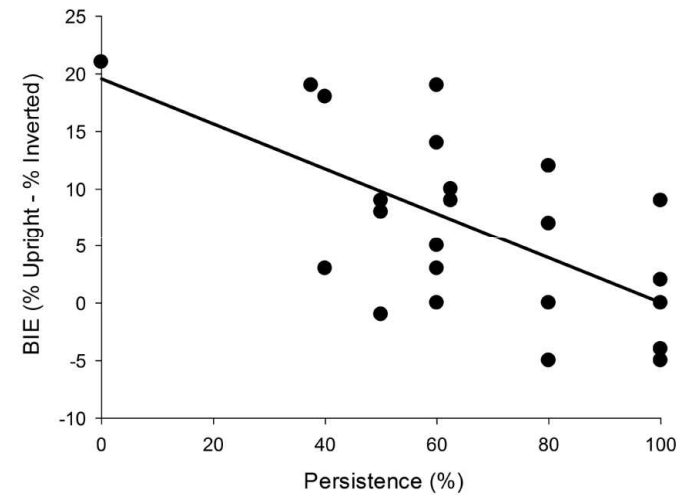
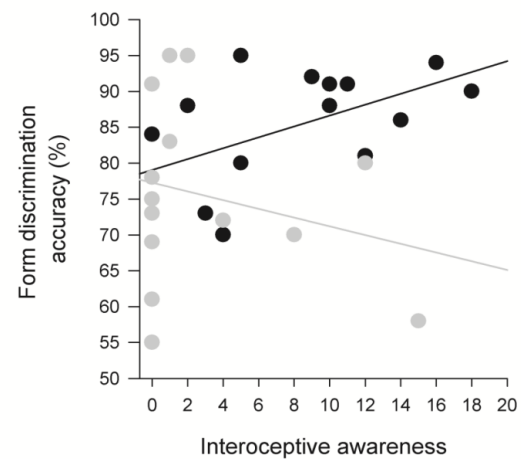
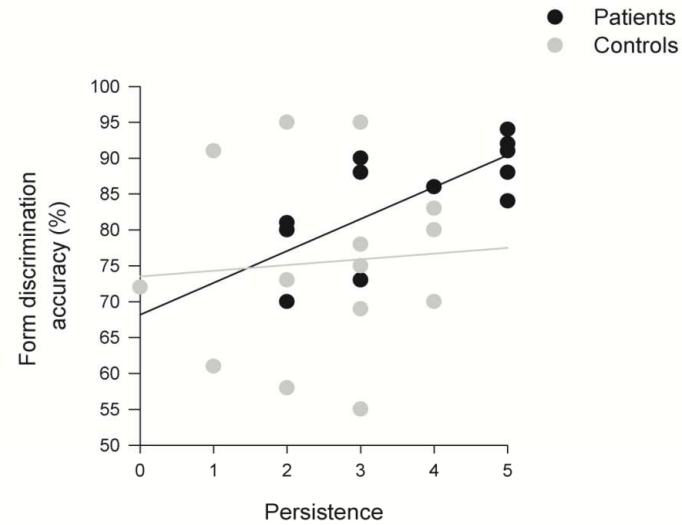
# Deficit di Elaborazione configurale nell'AN



Urgesi et al., *Br J Psychol* 2014



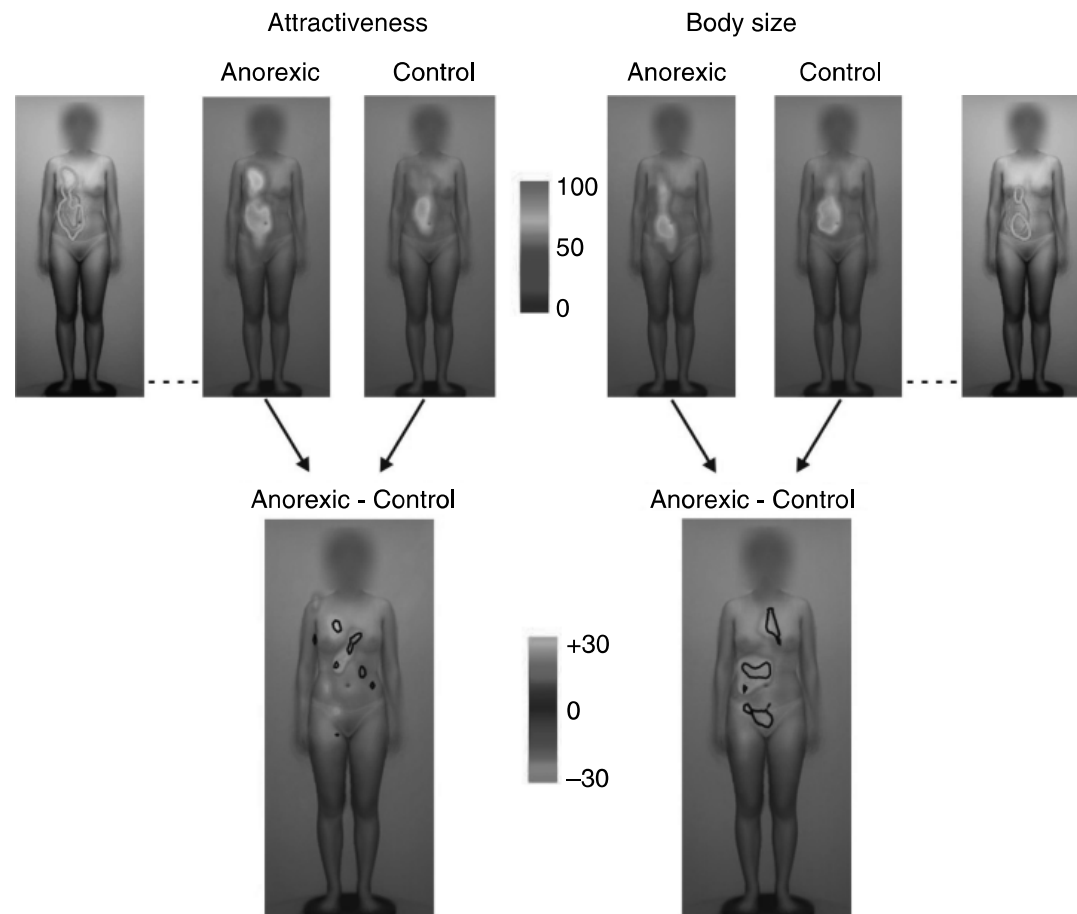
# Correlazione con Variabili Cliniche



Urgesi et al., 2014

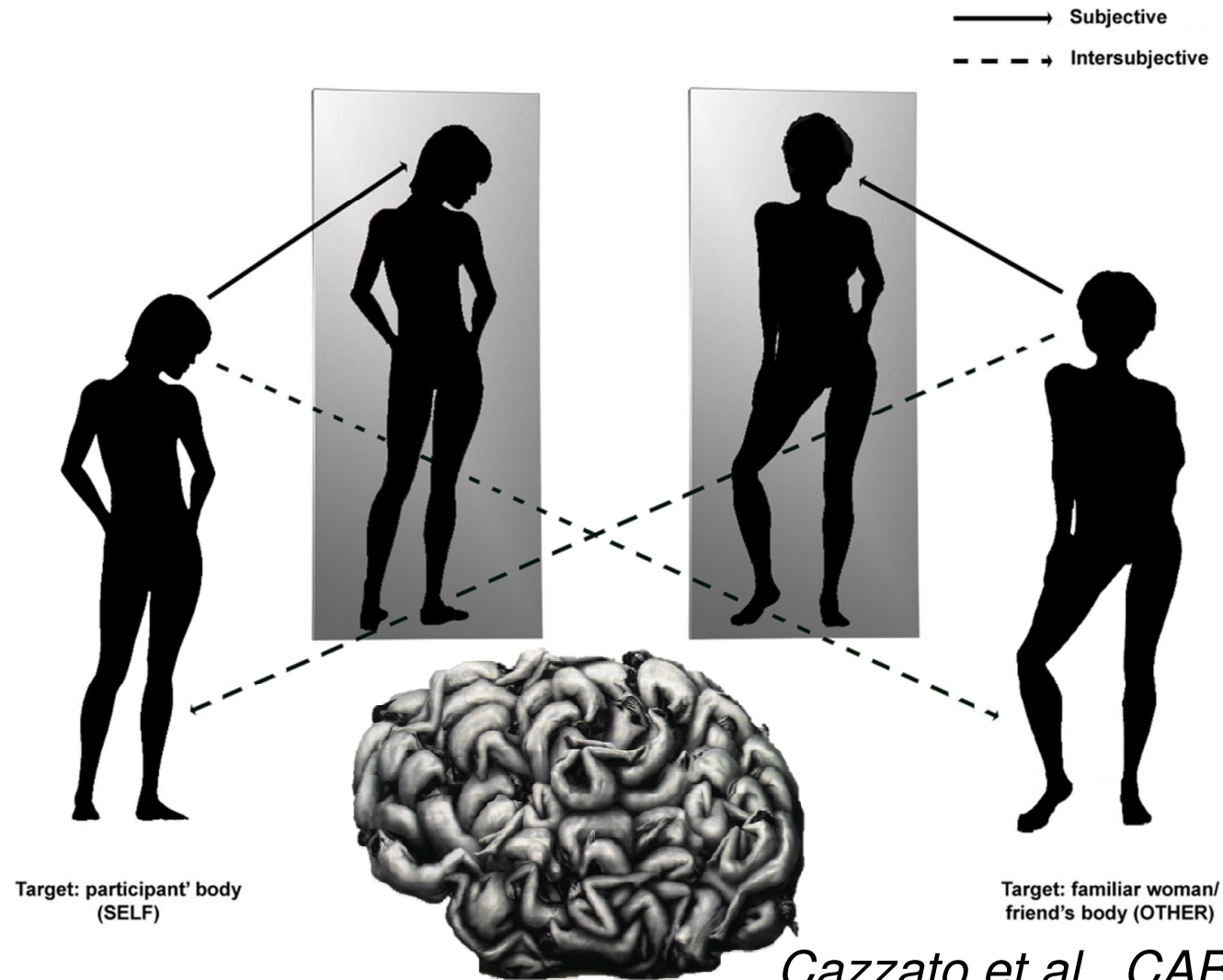
Urgesi et al., 2012

# Guardare il corpo in modo diverso



*George et al., 2011*

# La natura intersoggettiva della percezione corporea



## Body Image Revealer (BIR)



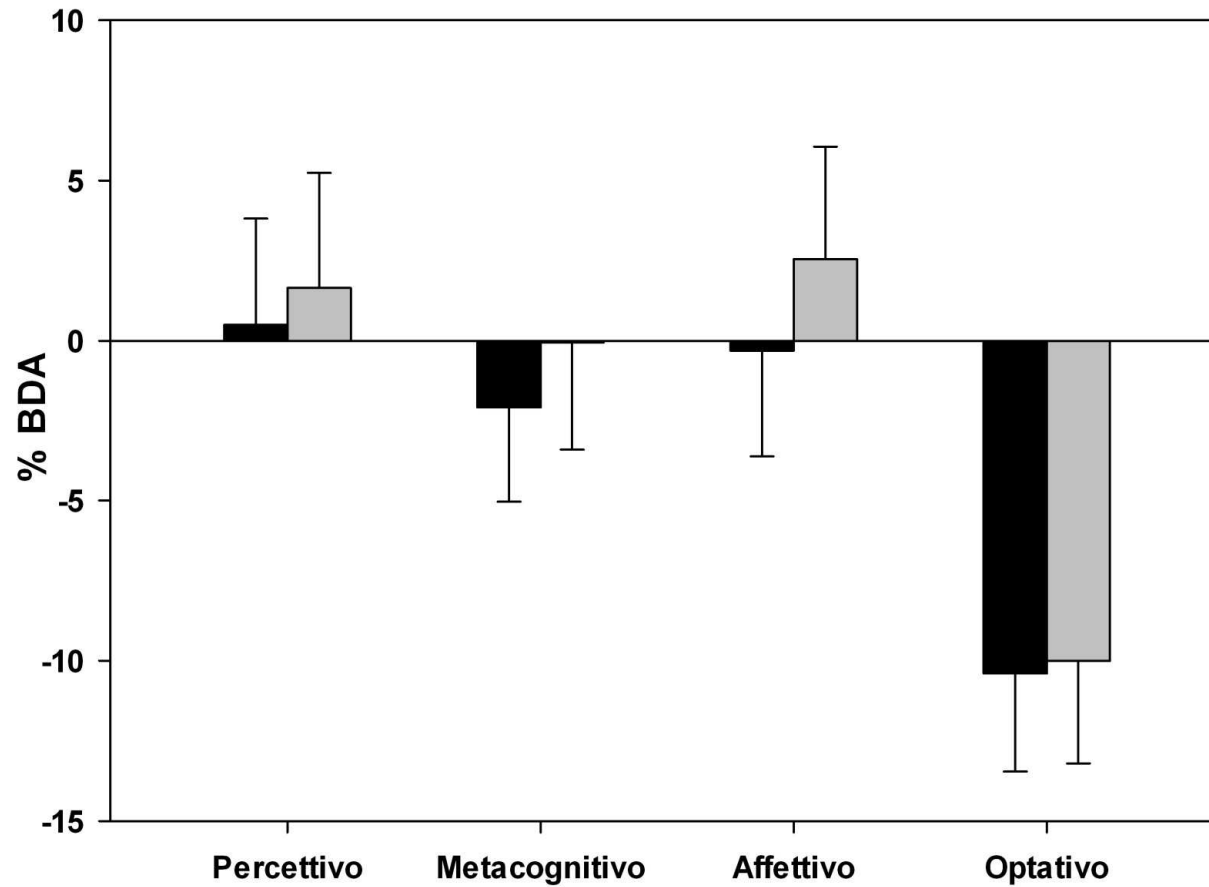
Dimensione del  
corpo Reale

Dimensione del corpo  
in Sovrappeso

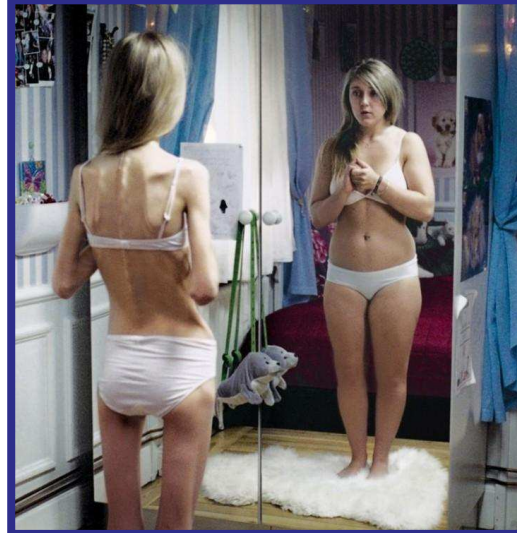
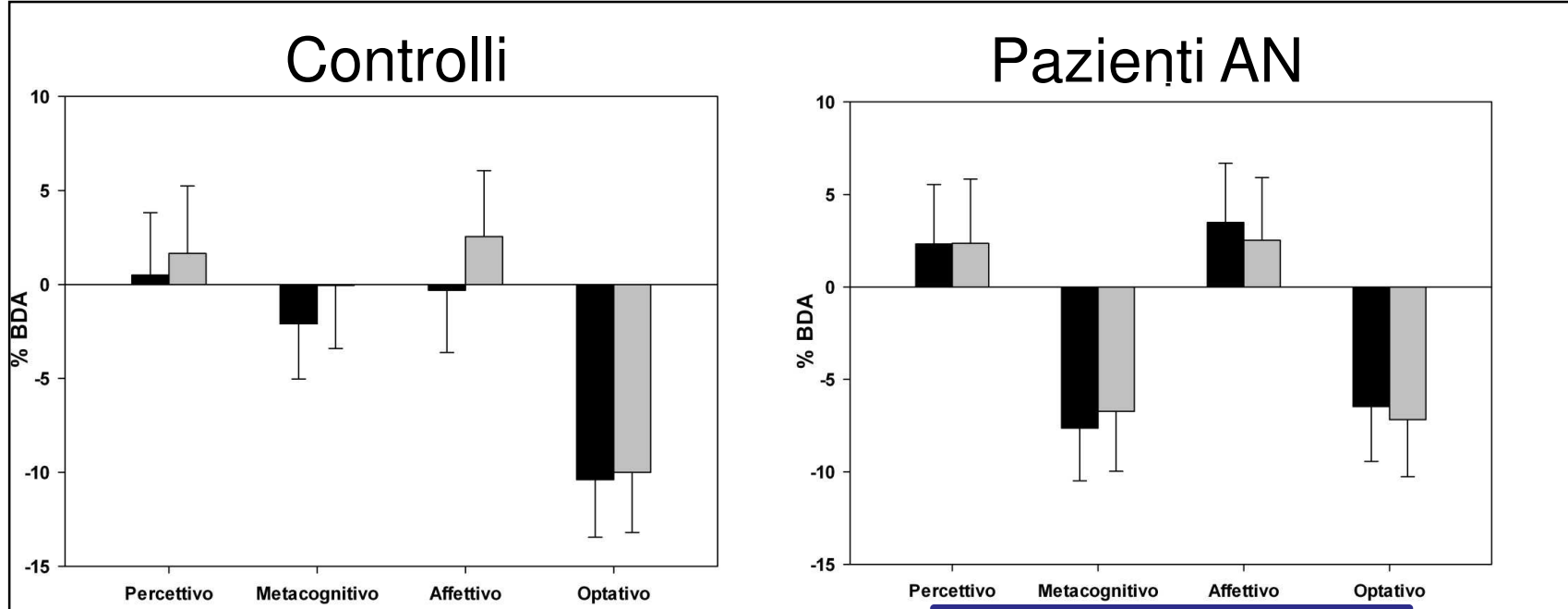
Dimensione del corpo  
in Sottopeso

*Mian & Gerbino, 2009*

# Discrepanza tra corpo attuale e corpo percepito --> insoddisfazione



*Cazzato et al., Exp Brain Res 2016*



*Cazzato et al., Exp Brain Res 2016*

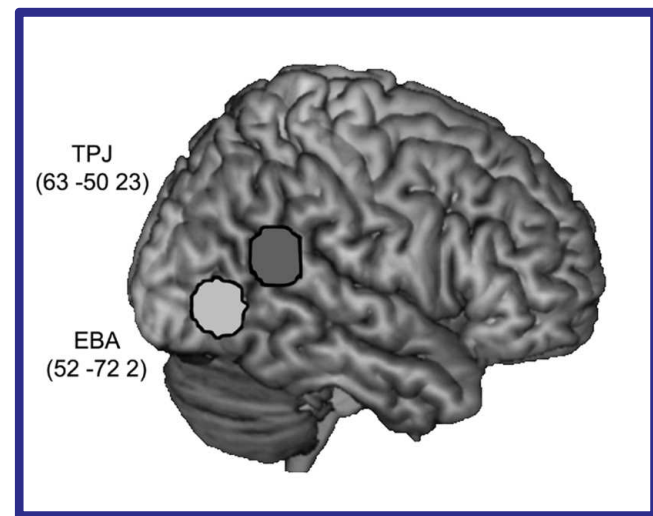
# Self-serving bias



# BIR

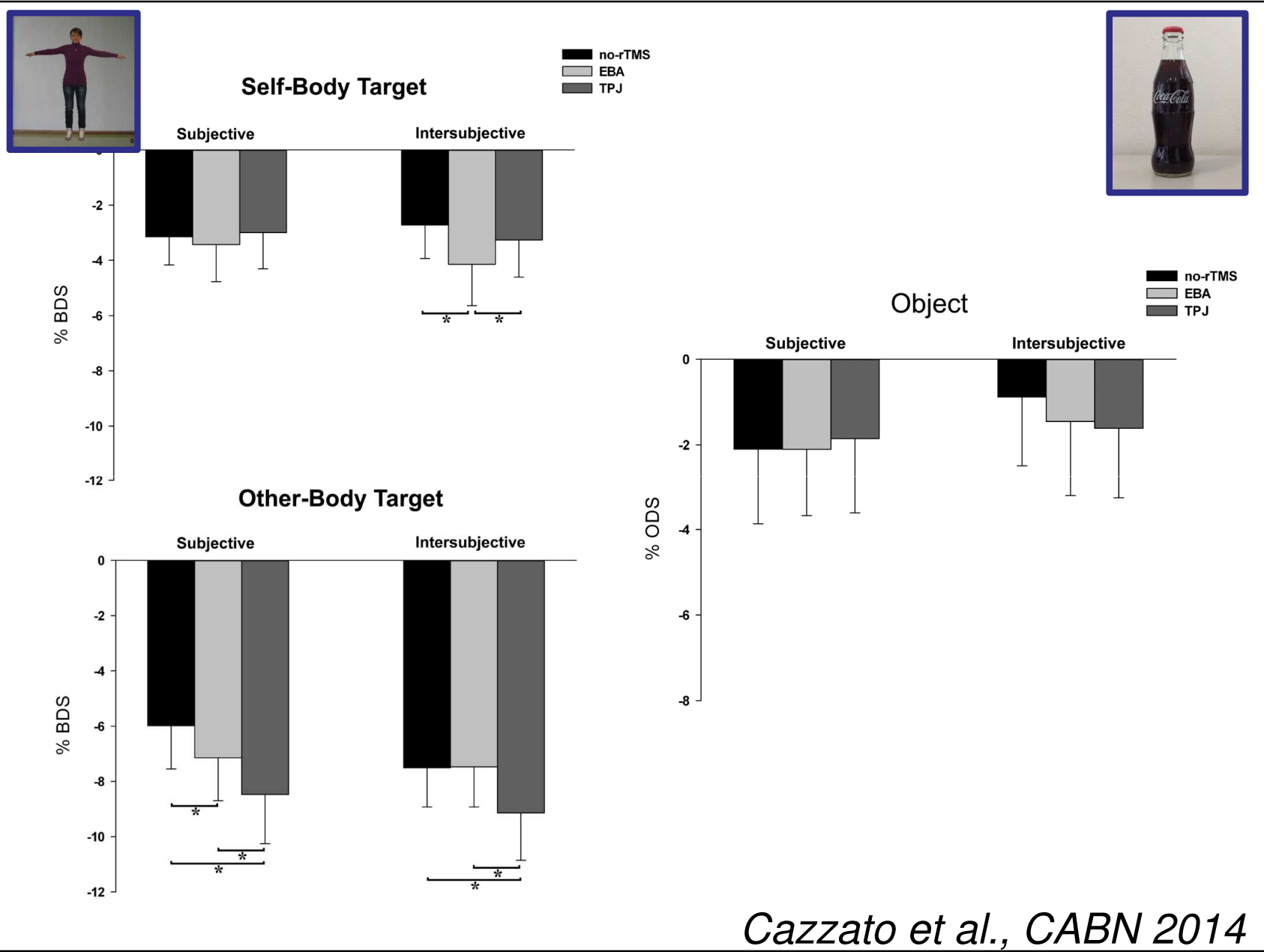


rTMS (1Hz)

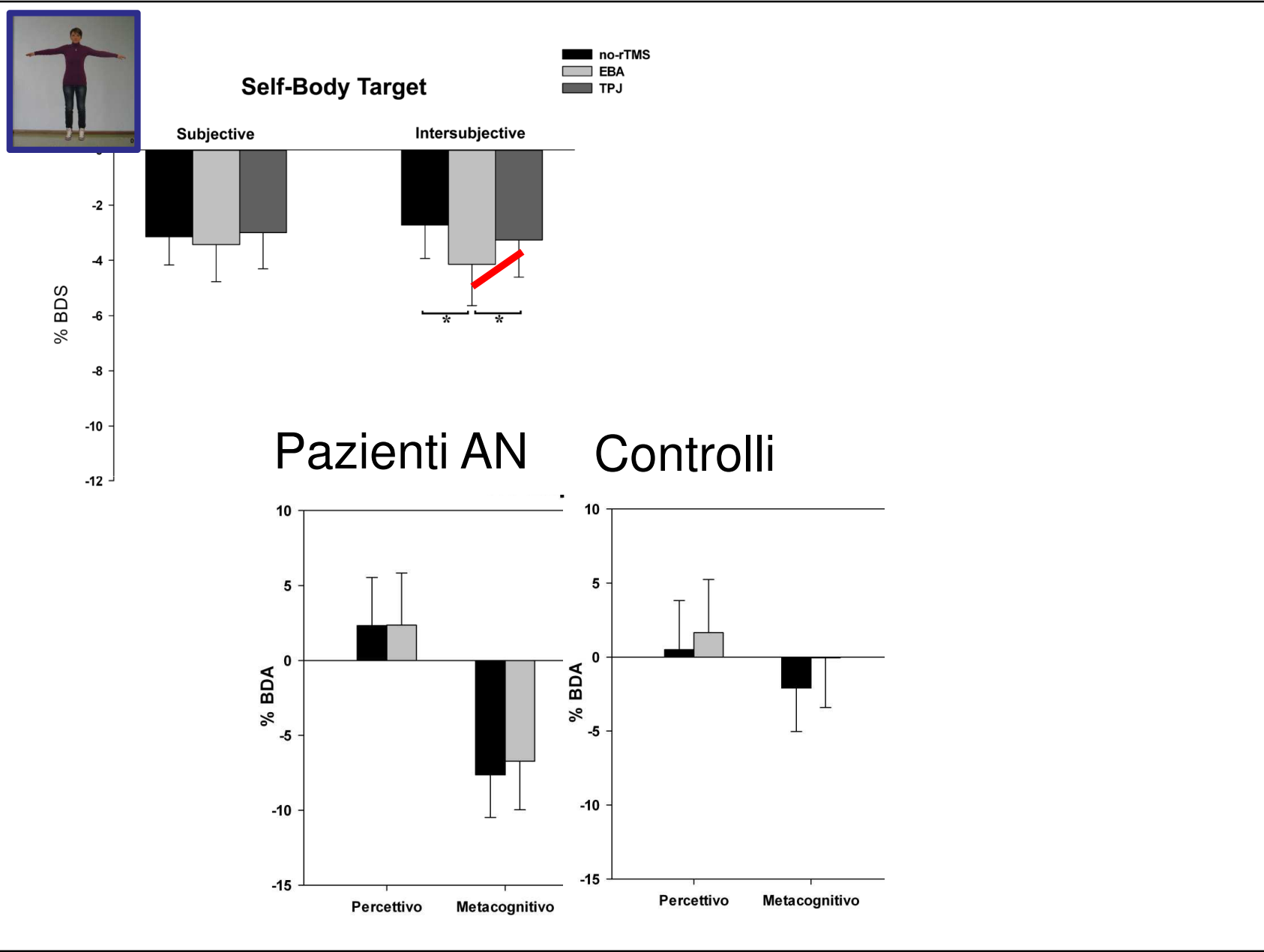


*Cazzato et al., CABN 2014*





Cazzato et al., CABN 2014



- EBA, soprattutto nell'emisfero destro, coinvolta nella prospettiva allocentrica sul corpo
- TPJ coinvolta nella rappresentazione del corpo degli altri
- Distorsioni a livello di queste aree possono portare a disturbi della rappresentazione percettiva e metacognitiva del corpo

# Se' e Corpo

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(Baumeister, RF, 1999. The Self in Social Psychology. Psychology Press /Taylor & Francis)



Riconoscimento visivo del proprio e altrui corpo/volto



**Senso di appartenenza del proprio corpo**

# Senso di appartenenza del proprio corpo

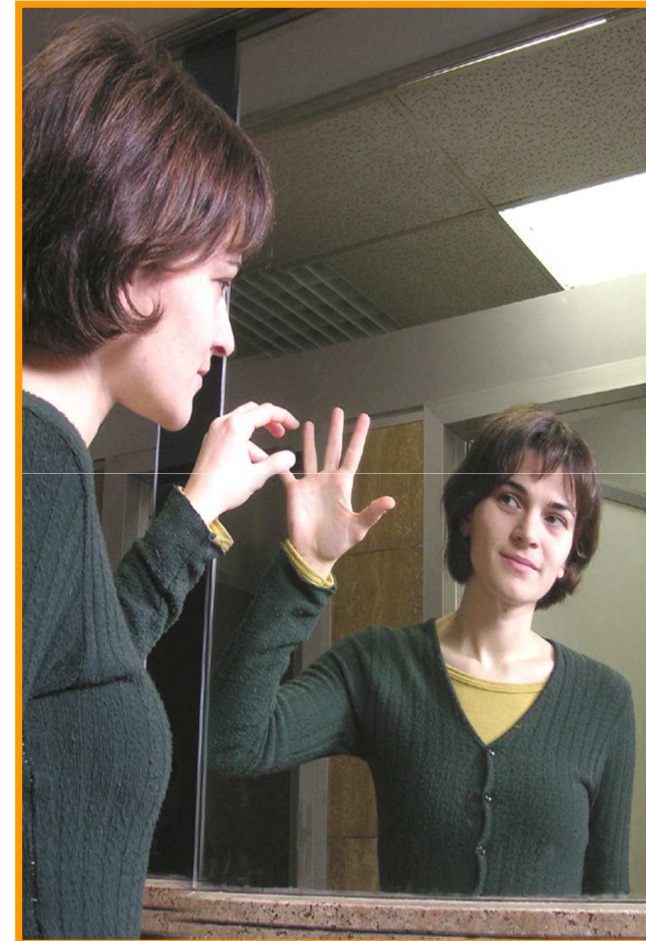
Il senso di appartenenza del proprio corpo nasce dalla integrazione tra informazioni visive, tattili, cinestesiche e uditive che scaturiscono dal nostro movimento.

Il ruolo che riveste l'integrazione multisensoriale è dimostrato da 2 situazioni:

- conflitto tra le informazioni provenienti da due canali sensoriali diversi.



- quadri clinici in cui si perde un tipo di informazione sensoriale.



# Illusioni Somatiche

Esempio: *Illusione di Pinocchio*

Un soggetto bendato si tocca la punta del naso con l'indice.  
Applicando una vibrazione ai muscoli del braccio si provoca l'illusione di distendere l'avambraccio.

contrasto tra informazione tattile e propriocettiva

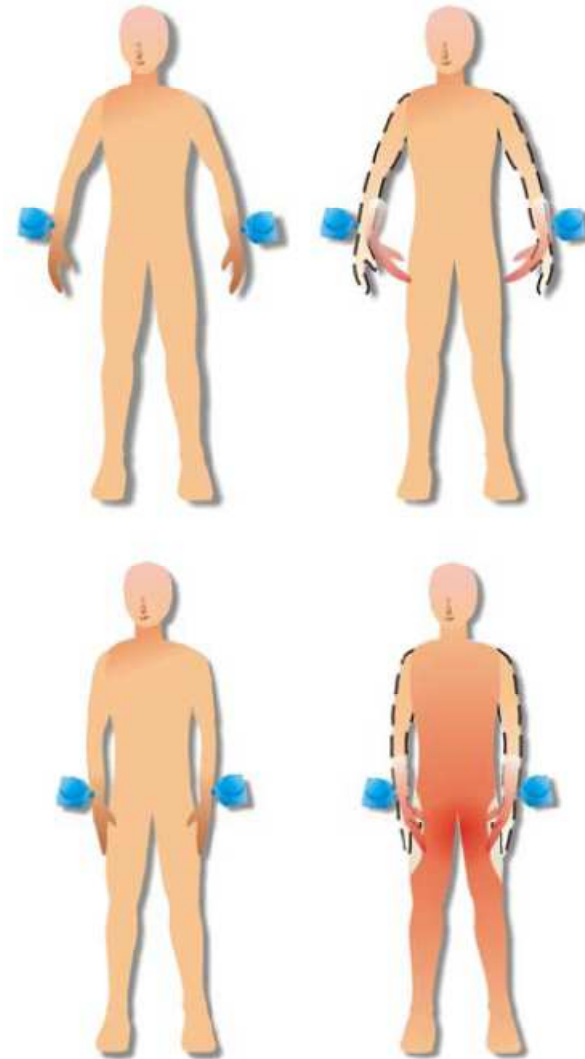
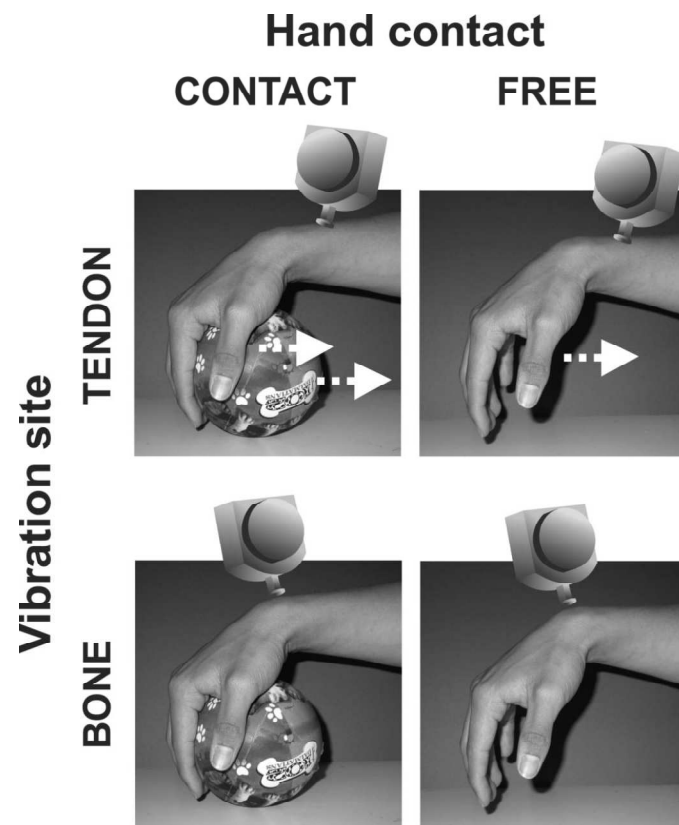


sensazione che il dito/naso si allunghino

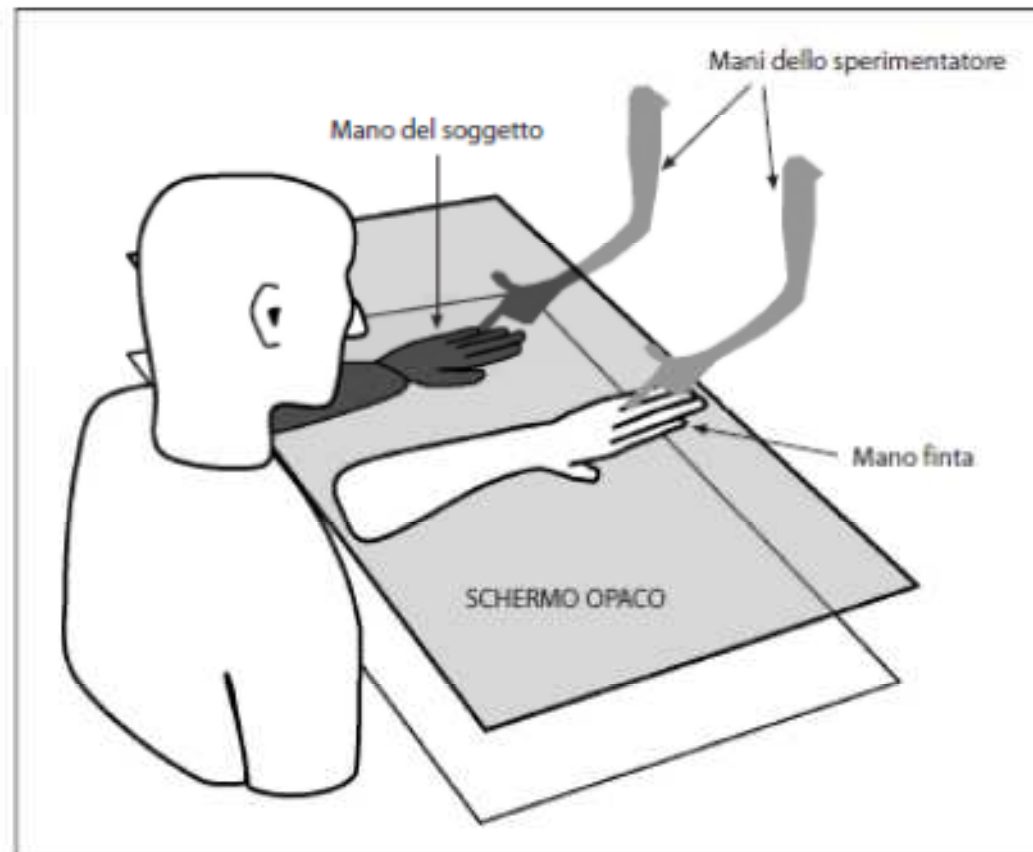
Il conflitto tra le modalità sensoriali distorce la rappresentazione della superficie corporea.

# Illusioni Somatiche

Illusione di movimento indotta dalla vibrazione tendinea



# La mano di Gomma



**fig. 4.1.** Effetto di «cattura visiva»: la sensazione tattile viene pian piano trasferita alla posizione della mano finta, se questa viene stimolata in maniera congruente.

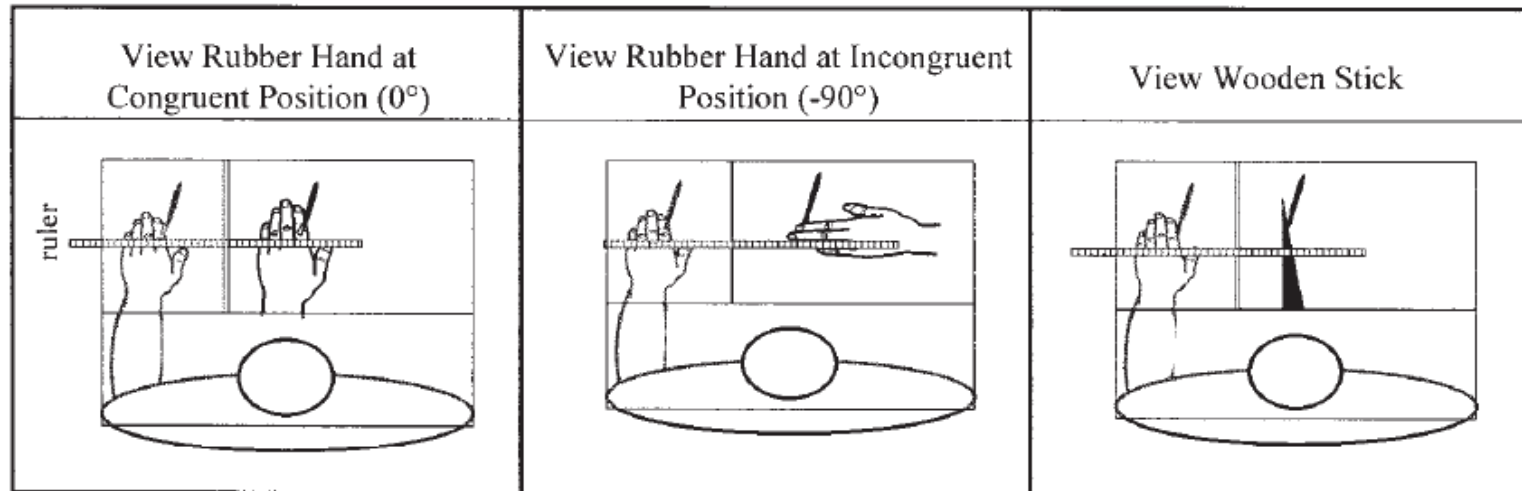


# Illusioni Somatiche

Rubber hands 'feel'  
touch that eyes see

Matthew Botvinick, Jonathan Cohen

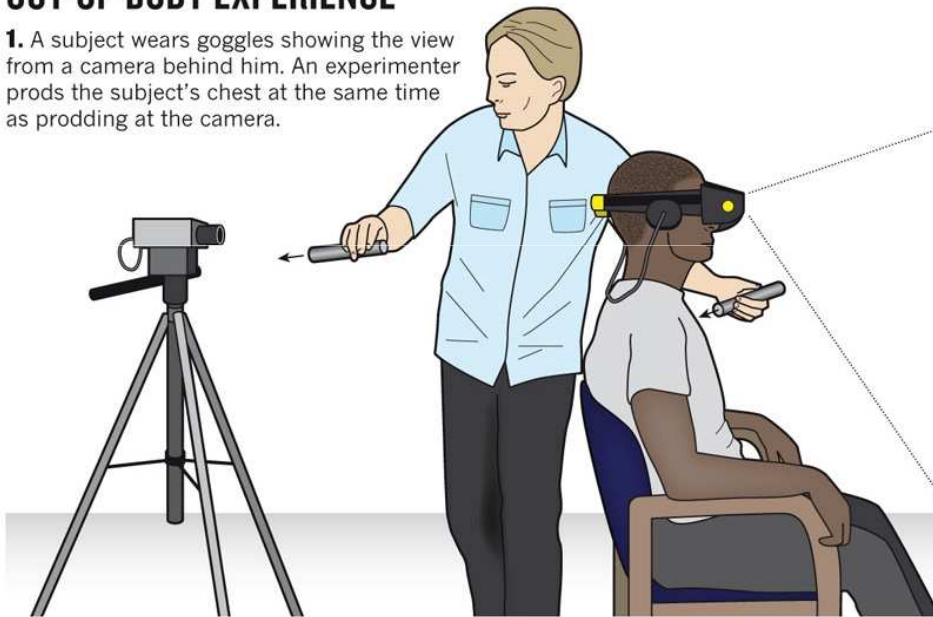
NATURE | VOL 391 | 19 FEBRUARY 1998



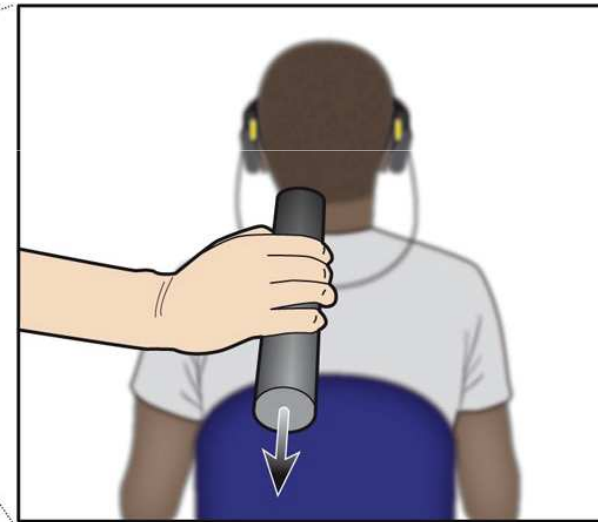
# Corpo Virtuale

## OUT-OF-BODY EXPERIENCE

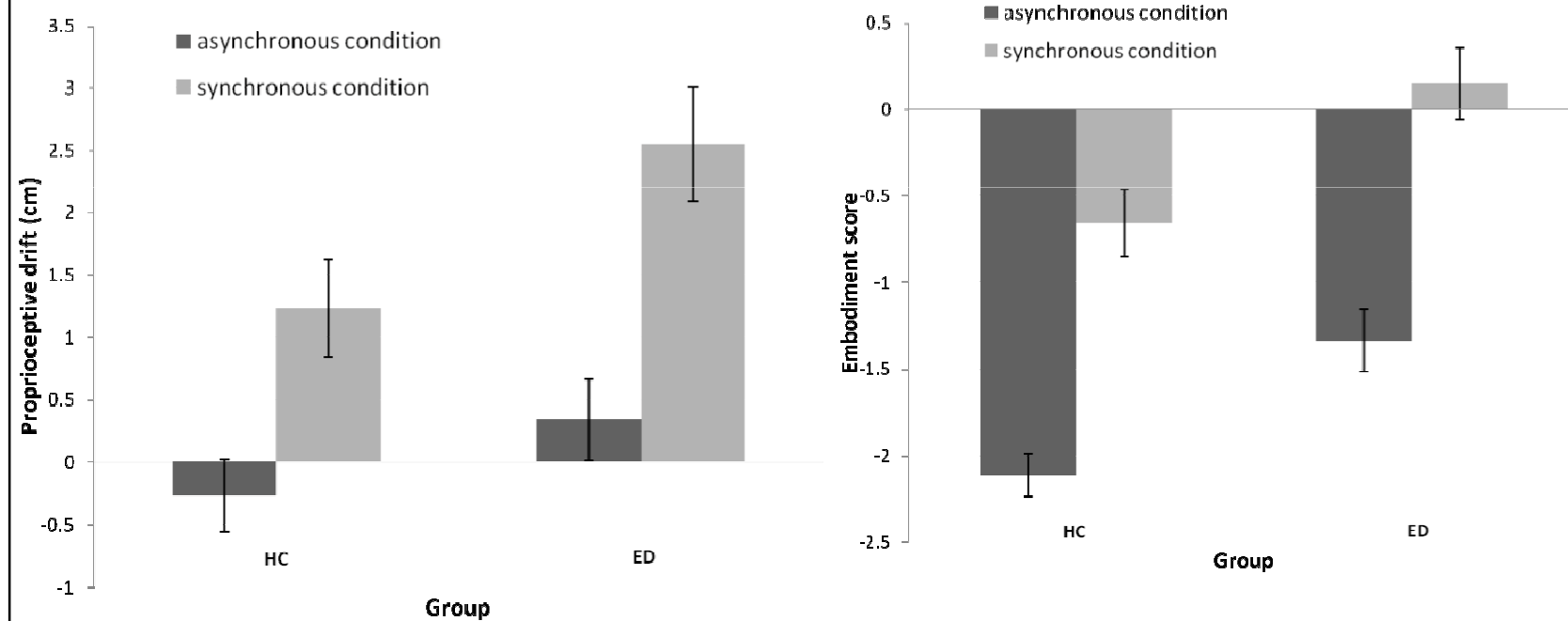
**1.** A subject wears goggles showing the view from a camera behind him. An experimenter prods the subject's chest at the same time as prodding at the camera.



**2.** The subject sees the hand prodding towards the camera as he feels his chest being prodded. He also sees his body from behind. This creates a vivid sense that his real body is floating behind the one he sees.

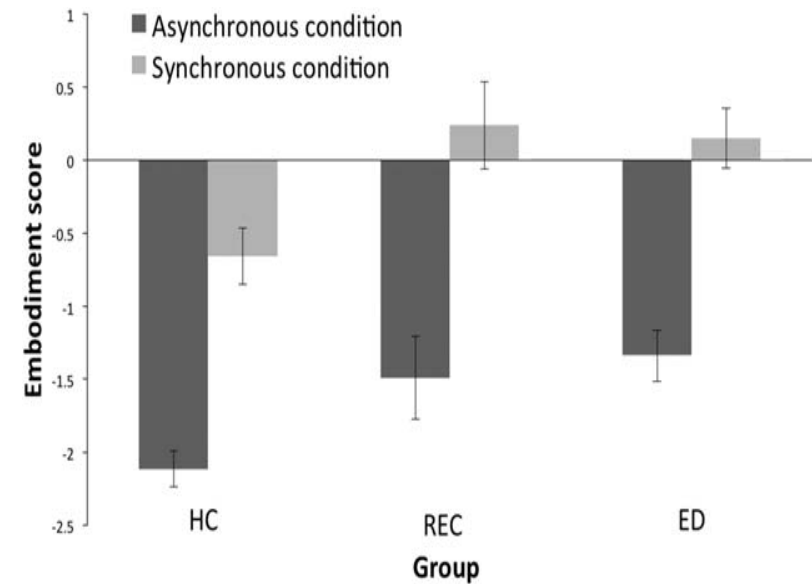
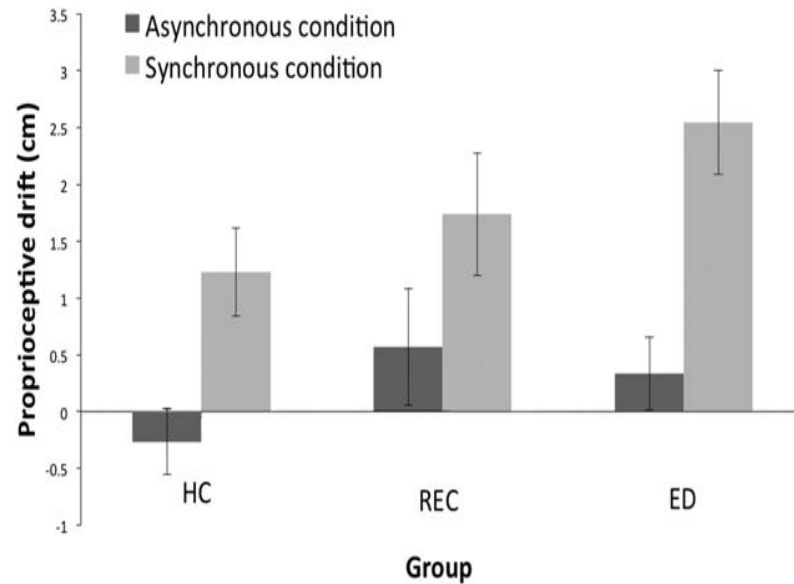


# Maggiore illusione in ED



*Eshkevari et al., 2012*

# Maggiore Illusione in recovered ED



*Eshkevari et al., 2014*

Sbilanciamento a favore input visivi

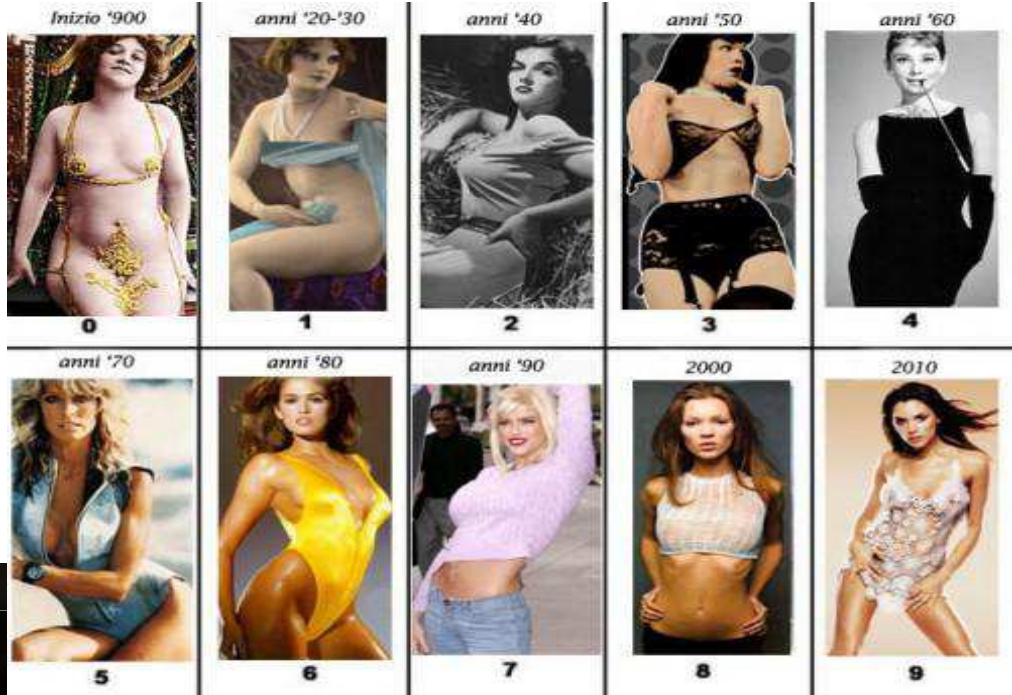
*Badoud and Tsakiris 2017*

# Incorporare un altro corpo riduce la sovrastima del proprio corpo



		AN (n = 30)		HC (n = 29)	
Pre FBI % misestimation		M	SD	M	SD
	height	0.97	2.98	1.57	2.67
	shoulder width	16.92	19.68	-3.70	12.42
	abdomen width	43.26	43.89	6.06	14.75
	hip width	35.01	31.79	1.73	10.74
	shoulder circumference	28.58	12.92	8.01	9.87
	abdomen circumference	60.46	25.37	21.02	11.97
	hip circumference	40.33	21.11	10.15	9.92
Post FBI sync % misestimation		M	SD	M	SD
	height	0.94	2.79	0.53	2.13
	shoulder width	7.65	18.61	-11.80	13.04
	abdomen width	42.63	36.98	5.71	18.68
	hip width	29.81	34.37	-0.97	13.05
	shoulder circumference	19.00	15.54	1.67	11.06
	abdomen circumference	48.94	30.42	20.26	17.17
	hip circumference	30.25	21.95	2.80	12.71

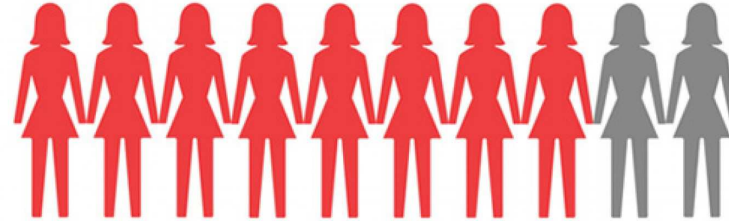
Keizer et al., 2014, 2016



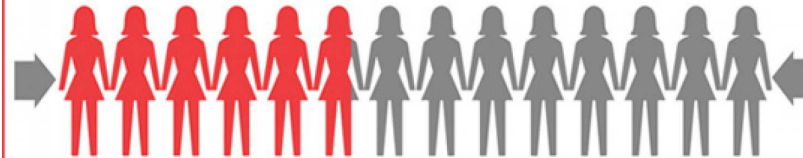


# Body Image Statistics

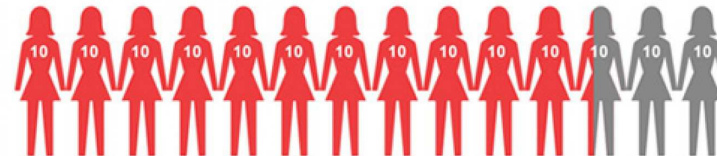
**80%** of women say that the images of women on television and in movies, fashion magazines, and advertising makes them feel insecure.



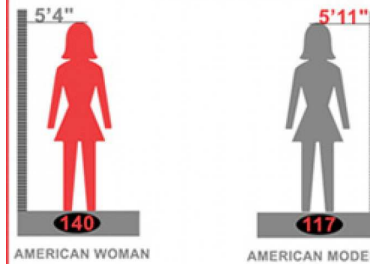
**42%** of girls first through third grades want to be thinner.



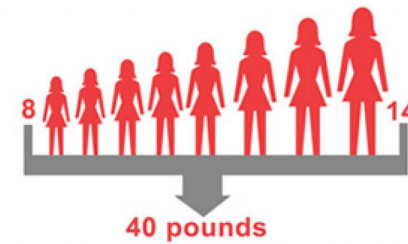
**81%** of 10 year olds are afraid of being fat.



The average American woman is **5'4"** tall and weighs **140** pounds, while the average American model is **5'11"** tall and weighs **117** pounds. Most fashion models are thinner than **98%** of American women.



More than half of teenage girls are, or think they should be, on diets. They want to lose some or all of the **40** pounds that females naturally gain between ages **8** and **14**. About **3%** of these teens go too far, becoming anorexic or bulimic.



[www.findyourtruebeauty.com/statistics](http://www.findyourtruebeauty.com/statistics)

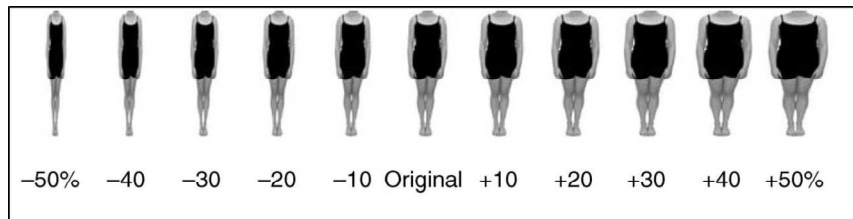
# Esperienza percettiva e estetica dei corpi

- Perceptual adaptation affects attractiveness of female bodies. Winkler C, Rhodes G. Br J Psychol. 2005.
- Body dissatisfaction and the effects of perceptual exposure on body norms and ideals. Glauert et al.. Int J Eat Disord. 2009.

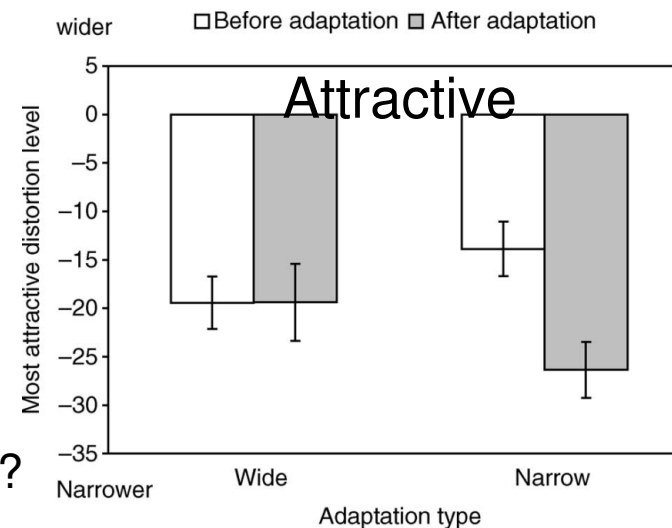
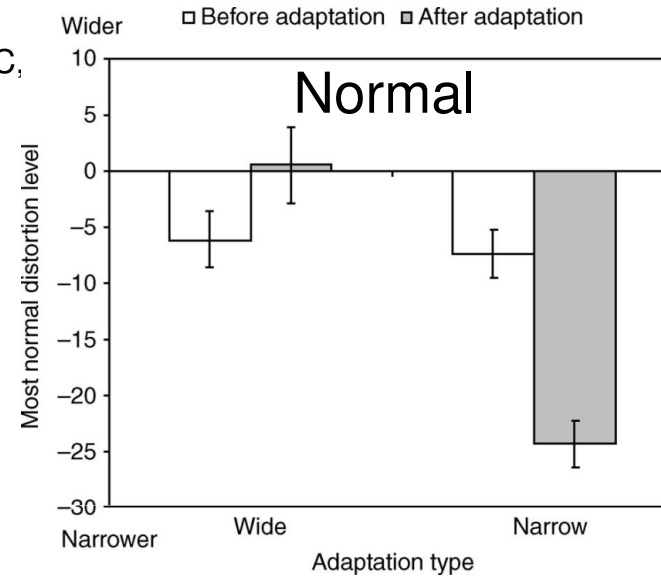


50% Wider than original body.

50% Narrower than original body.

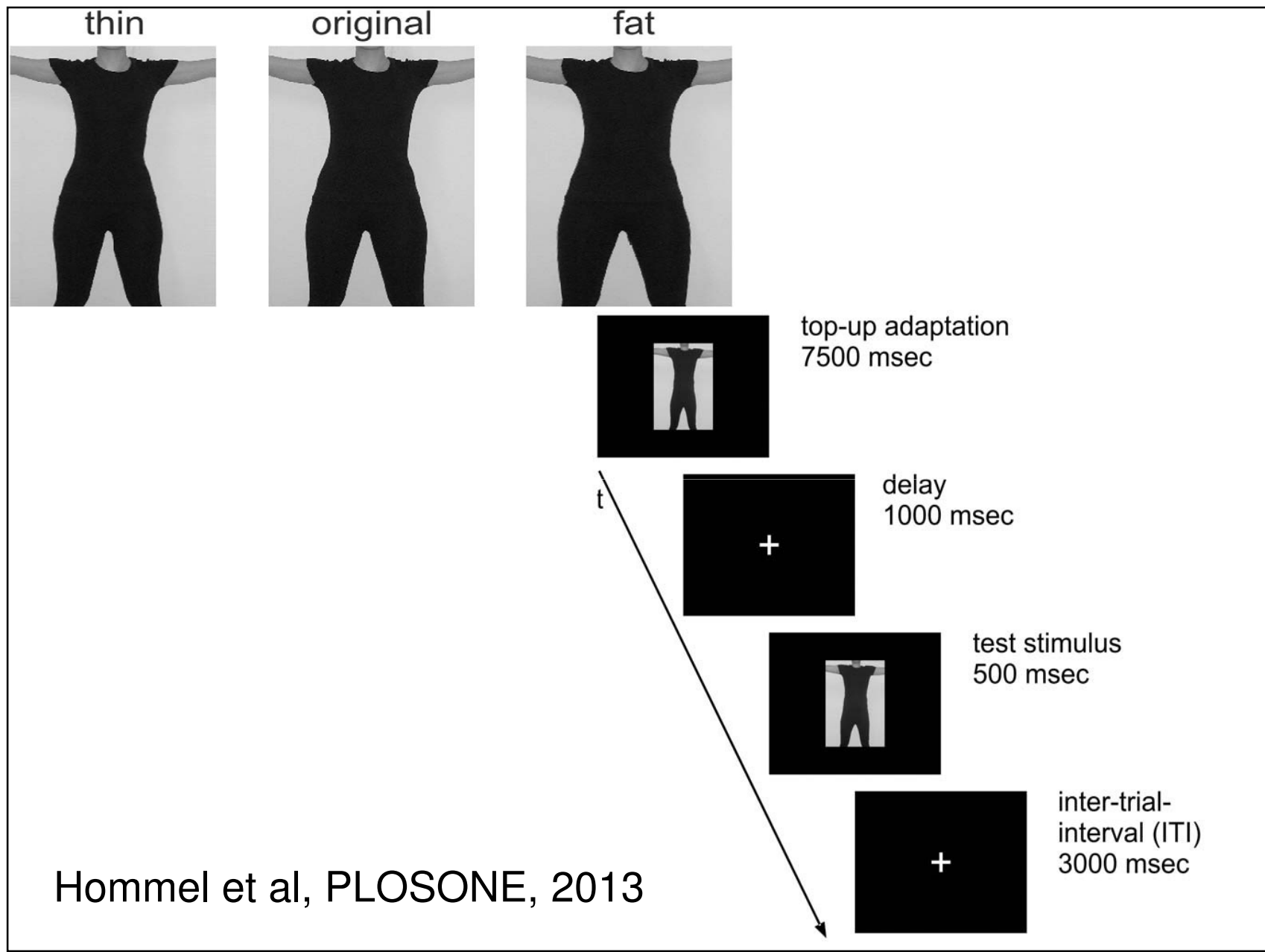


-50% -40 -30 -20 -10 Original +10 +20 +30 +40 +50%



Tasks: 1) Quanto normale? Quanto attraente?

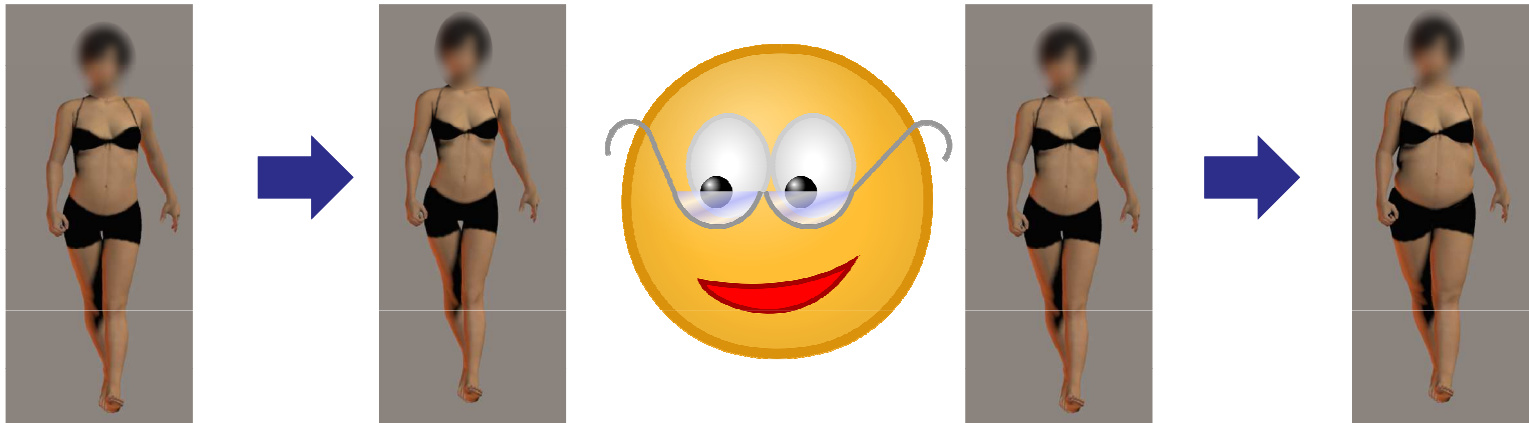




# Rigid norm-based coding in AN

- **H1: Perceptual adaptation** (opposite size misperception)

-Round exposure -> round  $\uparrow$  thin  $\uparrow$     -Thin exposure -> round  $\downarrow$  thin  $\downarrow$



- **H2: norm-based coding** (more familiar is better)

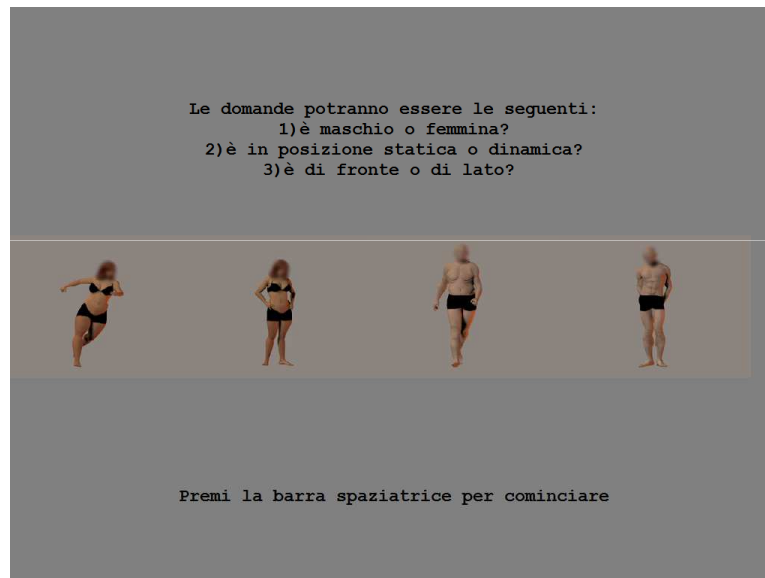
-Round exposure -> round  $\uparrow$  thin  $\downarrow$     -Thin exposure -> round  $\downarrow$  thin  $\uparrow$



# Thin or round models? The importance of perceptual experience in the esthetic appreciation of the body

Esposizione (8 min)

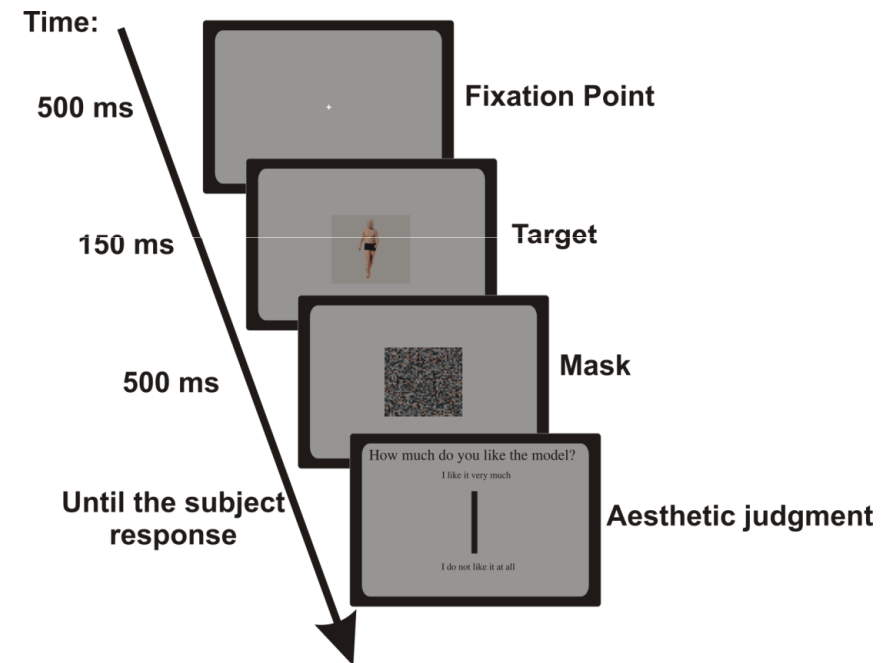
Valutazione pre vs post



Condizione Thin

Condizione Round

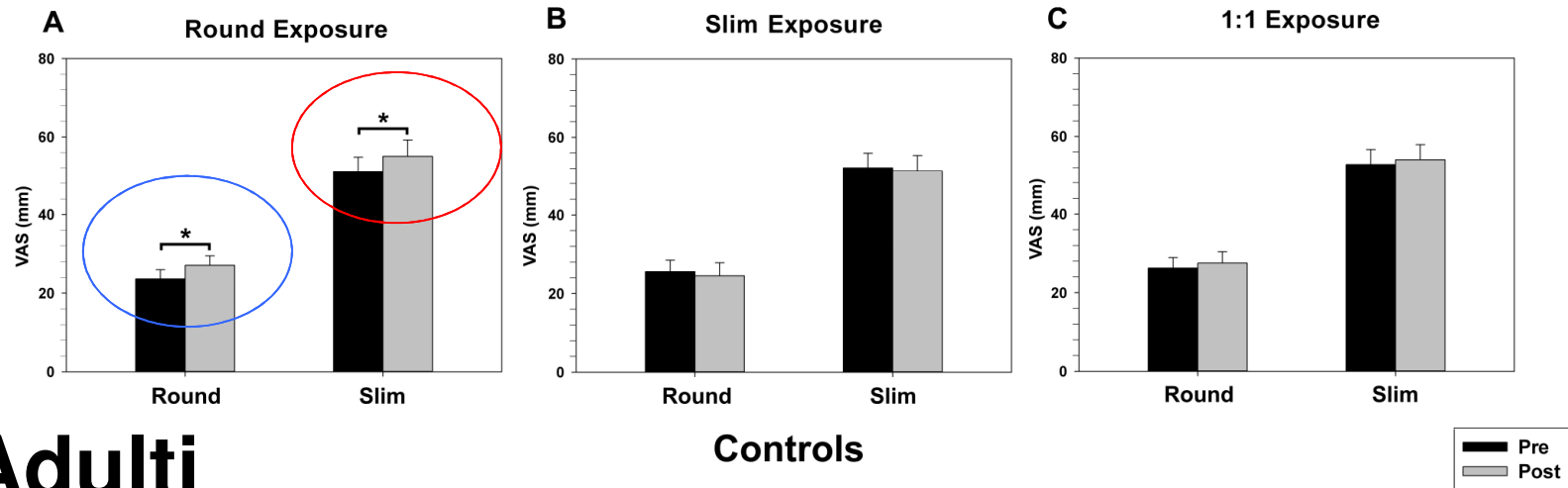
Condizione 50% Thin/Round



*Mele, Cazzato, Urgesi. PlosOne 2013*

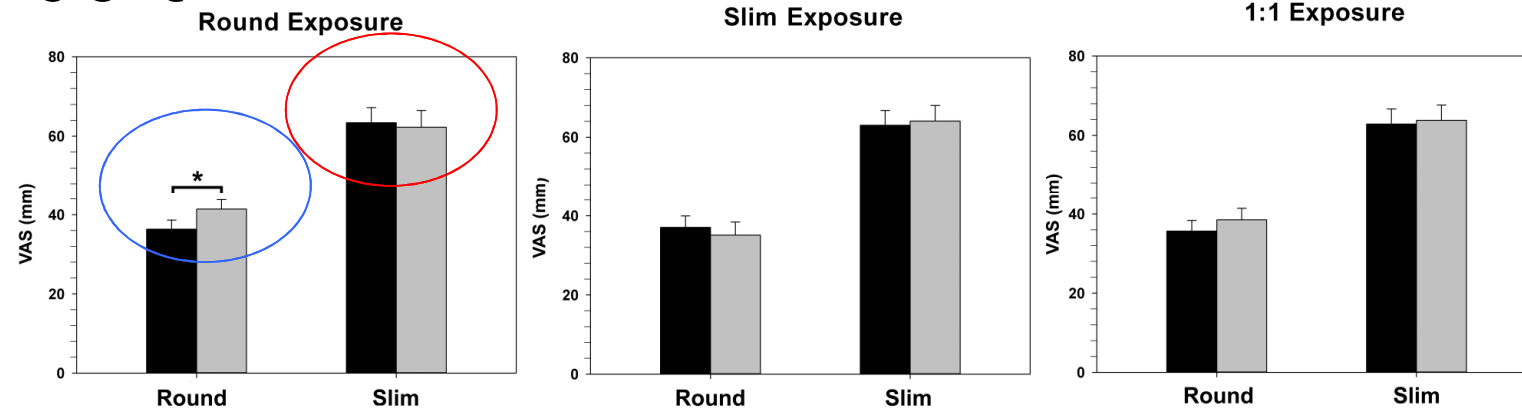
# Esperienza percettiva e estetica dei corpi

## Patients



## Adulti

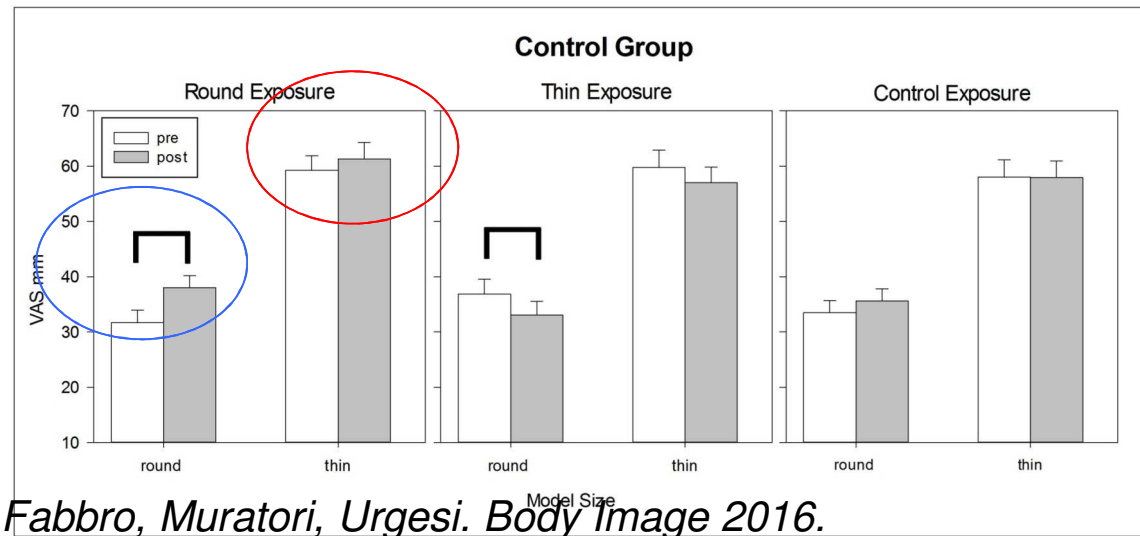
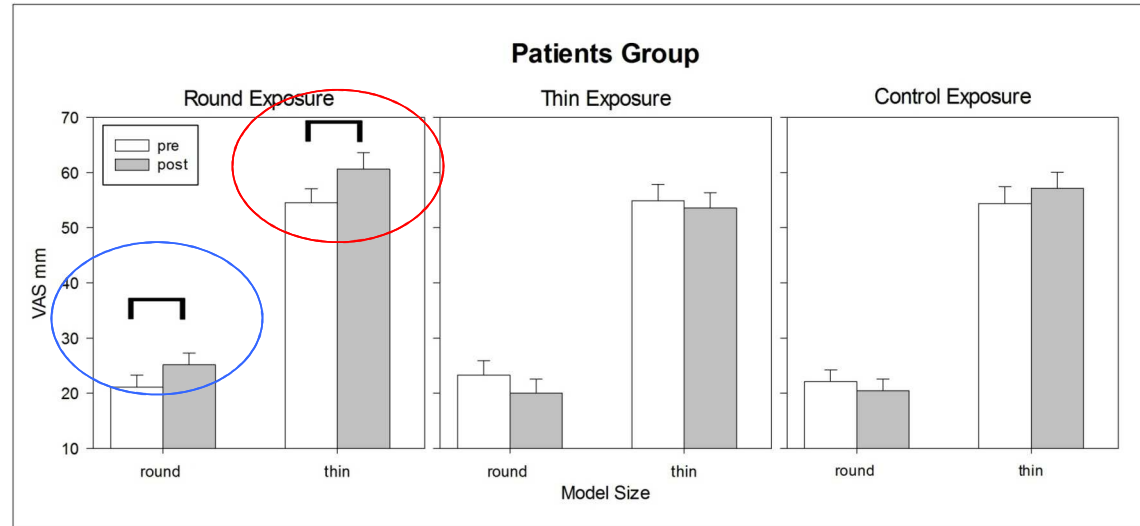
## Controls



*Cazzato, Mian, Mele, Tognana, Todisco, Urgesi. Exp Br Res 2015*

# Esperienza percettiva e estetica dei corpi

## Adolescenti

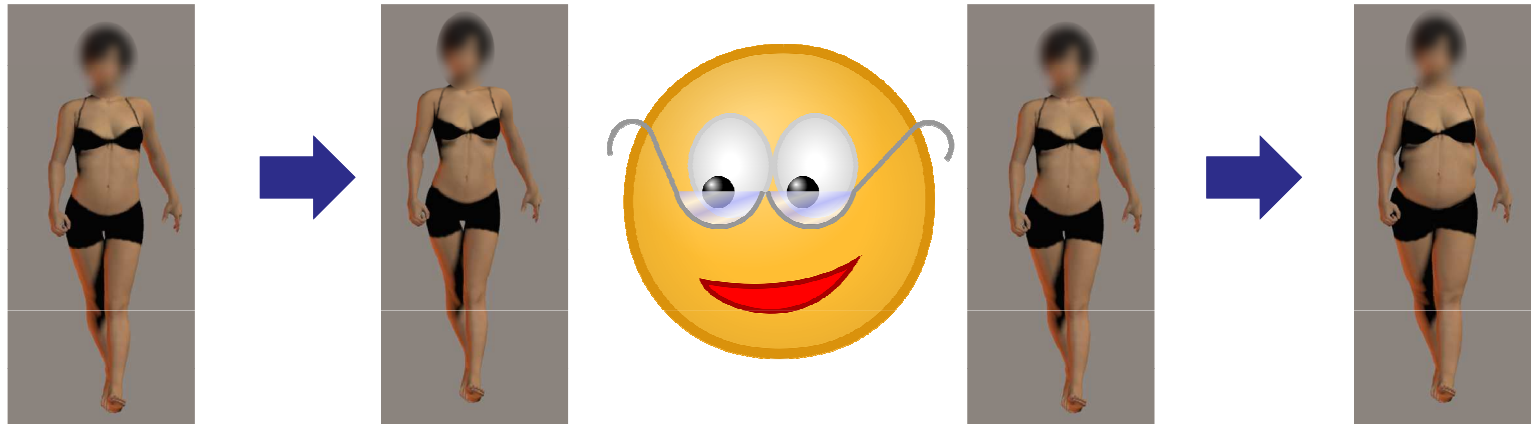


Mele, DiTaranto, Cazzato, Fabbro, Muratori, Urgesi. *Body Image* 2016.

# Rigid norm-based coding in AN

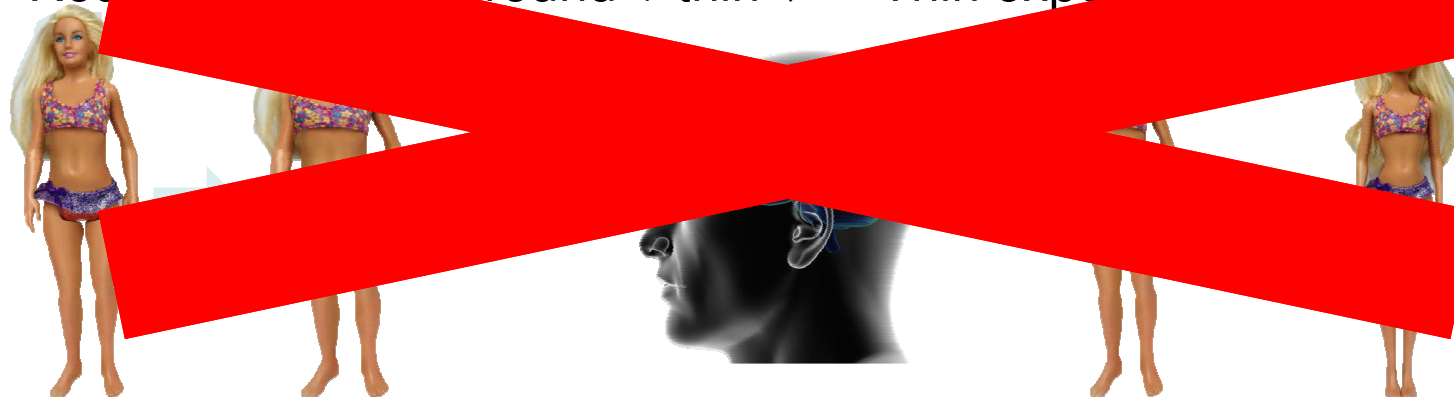
- **H1: Perceptual adaptation** (opposite size misperception)

-Round exposure -> round  $\uparrow$  thin  $\uparrow$       -Thin exposure -> round  $\downarrow$  thin  $\downarrow$



- **H2: norm-based coding** (more familiar is better)

-Round exposure -> round  $\uparrow$  thin  $\downarrow$       -Thin exposure -> round  $\downarrow$  thin  $\uparrow$



# Conclusioni

- La percezione delle forme corporee coinvolge aree selettive nelle aree visive del nostro cervello, che hanno un ruolo fondamentale nella sua valutazione estetica
- Le pazienti con AN presentano un'alterata sensibilità alla esperienza percettiva con il corpo legata a tratti ossessivi.
- Il funzionamento delle aree percettive del corpo potrebbe essere influenzato (o influenzare) la sensibilità a modelli estetici del corpo
- Le alterazioni della percezione visiva del corpo (e sue basi neurali) nelle pazienti che sviluppano AN potrebbe essere associata alla loro alterata sensibilità ai modelli estetici di estrema magrezza.



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GRAZIE!



Emanuel Mian

<https://bodylabudine.uniud.it>



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