



SCUOLA
ALTI STUDI
LUCCA



Body-size misperception alters self-identity recognition in healthy individuals and Eating Disorders

**Social & People Evolution – Nuove
scoperte del cervello nei disturbi della
nutrizione e dell'alimentazione**

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Eating Disorders

Bulimia Nervosa

Anorexia Nervosa

Pica

Rumination
Disorder

Binge-Eating
Disorder

Avoidant/Restrictive
Food Intake Disorder

Other Specified Feeding
or Eating Disorder

Unspecified Feeding or
Eating Disorder

Anorexia Nervosa

Excessive concern about the body weight

Restriction of food intake with excessive weight loss

BMI (Body Mass Index) < 18

Restricting Subtype

Excessive control on food intake, physical exercise and weight measures, without compensatory behaviors

Binge-Purging Subtype

The body weight is controlled by means of compensatory behaviors: excessive food intake followed by eliminatory conducts, such as vomiting
Sense of **lack of control** over eating behavior.

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Excessive food intake followed by **compensatory behaviors** (eliminatory conducts, such as vomiting)

Sense of **lack of control** over eating behavior

Experiences of **shame** and **guilt** after uncontrolled food intake

BMI (Body Mass Index) > 18

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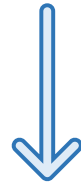
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Eating Disorders

Anorexia
Nervosa



Bulimia
Nervosa

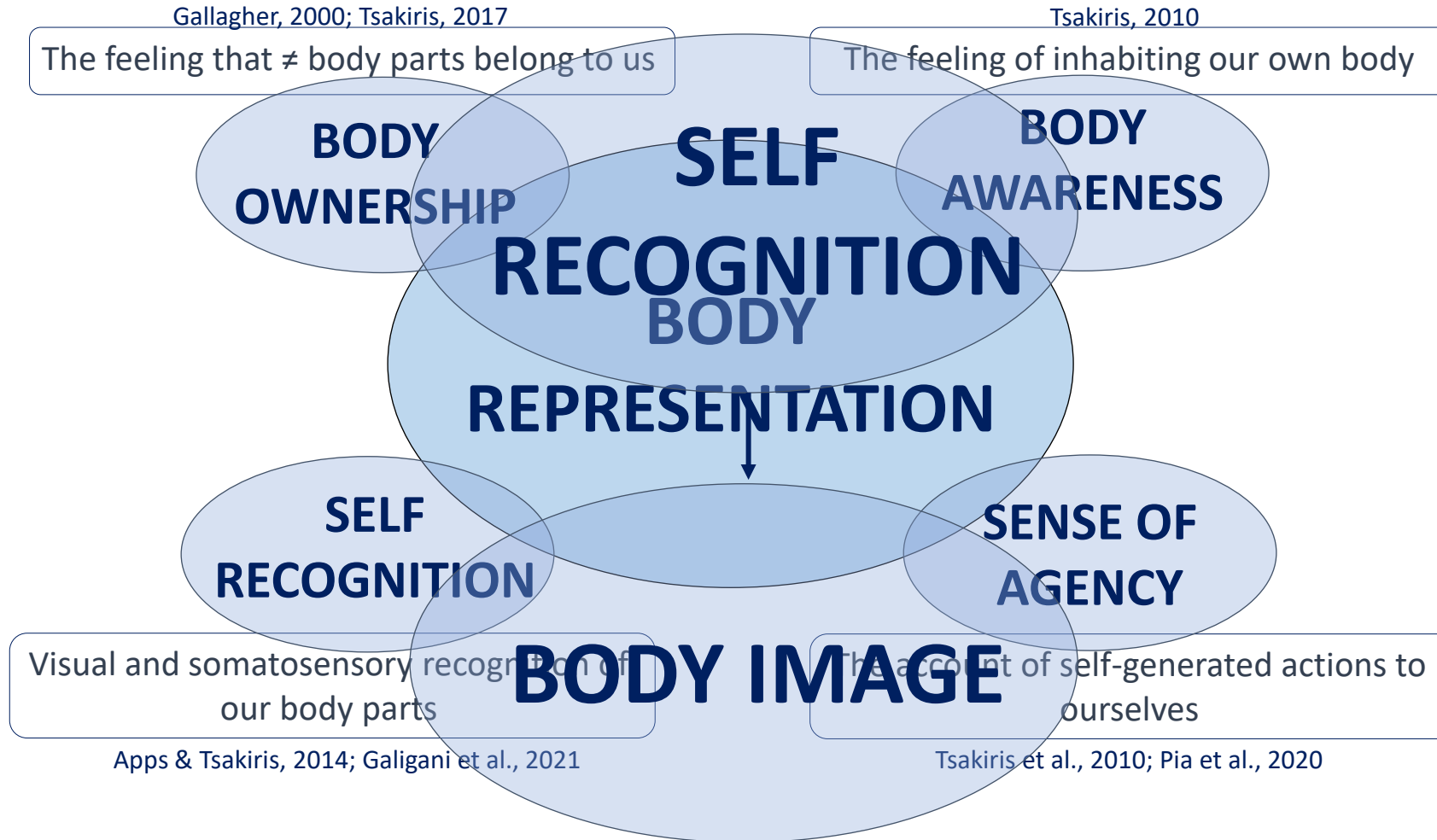


Binge-Eating
Disorder



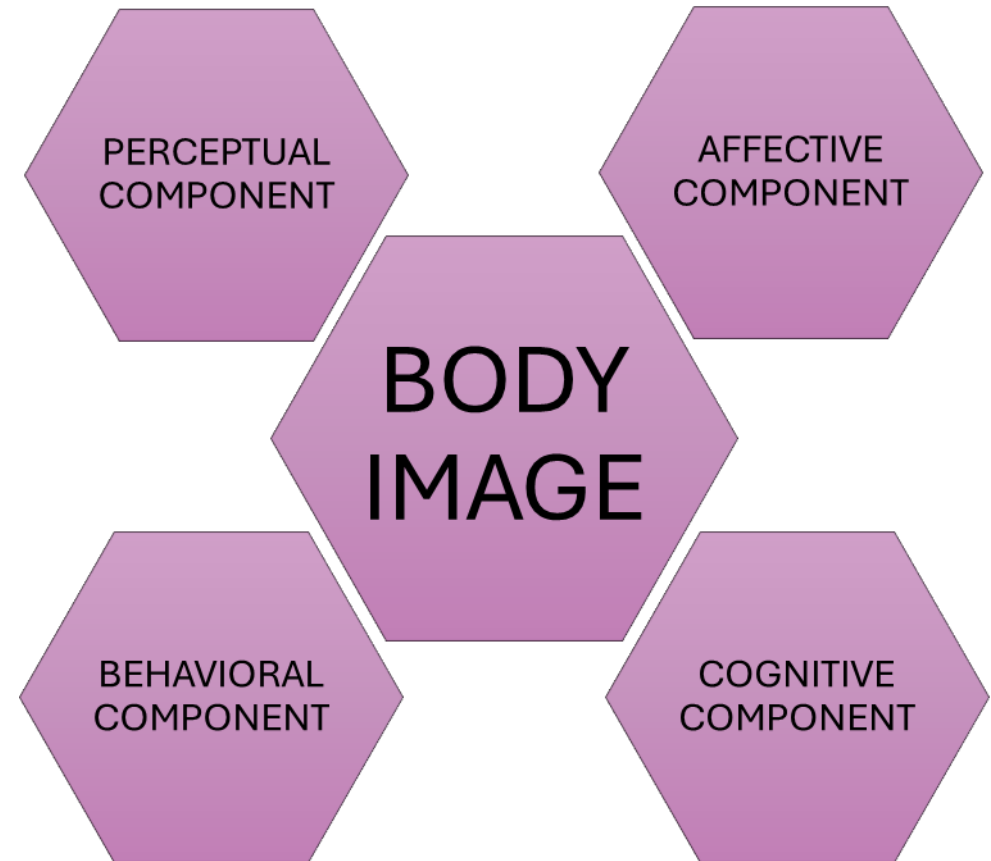
***Alterations of body representation
&
Body Image Distortions***

What is body representation?



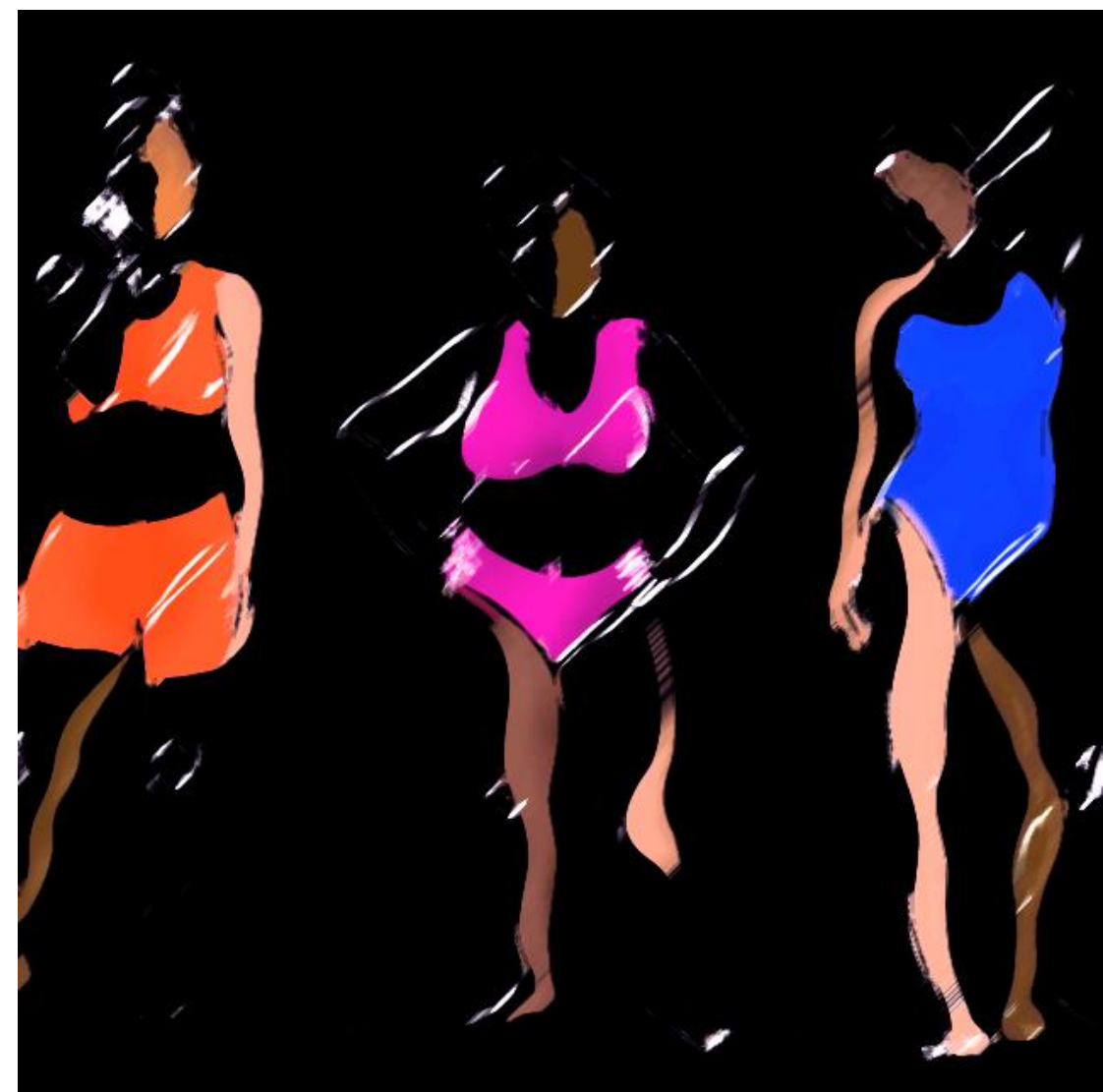
What is the body image?

Body image is the subjective perception and attitudes an individual has towards the own body



Cash, T. F., & Smolak, L., 2011

What is the body image?



Neuropsychological and Psychiatric condition can lead to delusional body image perception



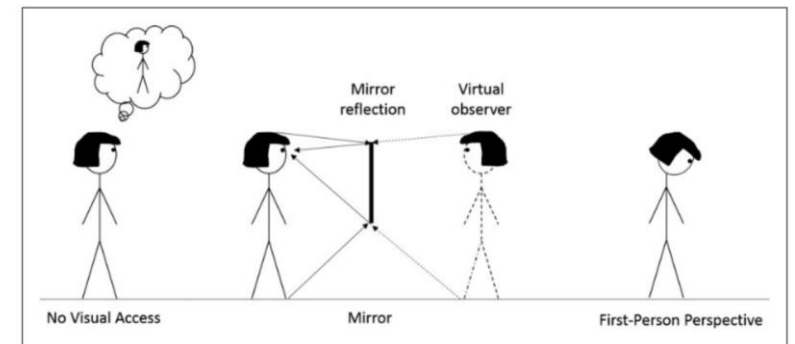
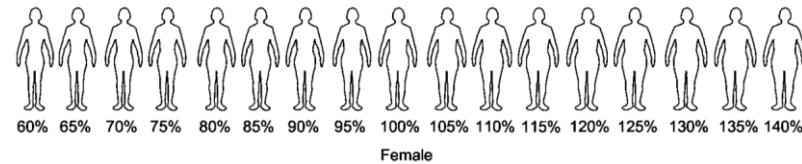
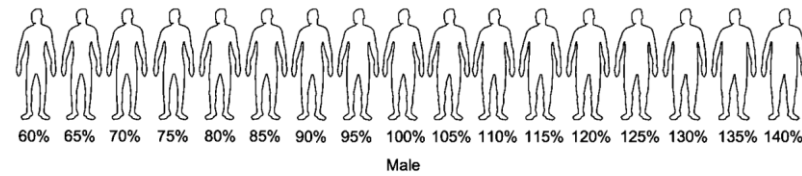
Misperception of body-size and shape

Slade, 1994

What is the body image?

Even healthy individuals may exhibit body image alterations, such as body-size misperception

BODY IMAGE ASSESSMENT SCALE



Gardner et al., 2009, 2012; Thaler & Guess, 2018

Body Image Distortion in Eating Disorders

One key symptom of ED that often motivates the detrimental dietary behavior is **Body Image Distortion**



cognitive–affective component

negative feelings and appraisals toward the body

(e.g., body dissatisfaction, overvaluation of shape or weight, preoccupation with shape or weight, and fear of weight gain).
patients are usually *consciously aware of* and well able to describe
It can be measure by *questionnaires*.



perceptive component

Accuracy in estimating body size
(i.e., tendency to perceive own body as bigger than it actually is)
Less conscious in everyday life
it can be measure by visual and metric
body size estimation task
(i.e., select or configure the picture so that it best matches their own body)

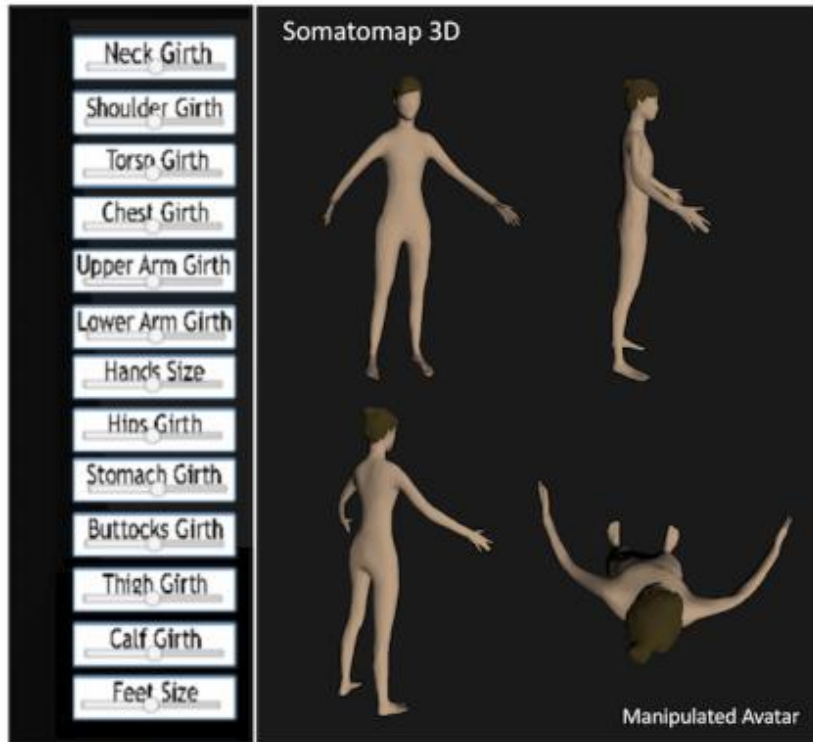
Body Image Distortion in Eating Disorders

scientific reports

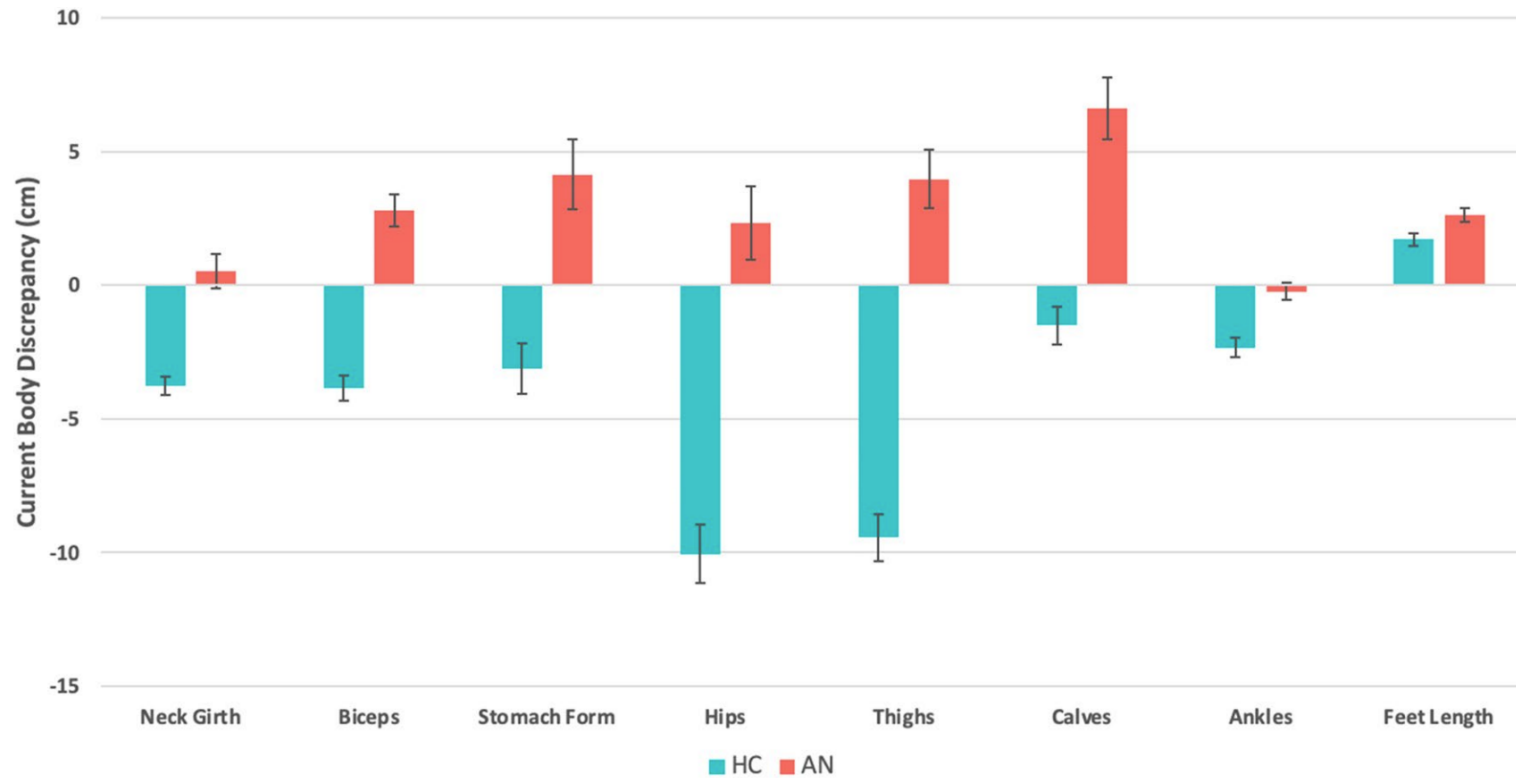
OPEN Visual mapping of body image disturbance in anorexia nervosa reveals objective markers of illness severity

Christina Ralph-Nearman^{1,2,3}, Armen C. Arevian⁴, Scott Moseman⁴, Megan Sinik¹, Sheridan Chappelle¹, Jamie D. Feusner^{4,5,7} & Sahib S. Khalsa^{1,2,3}

Check for updates



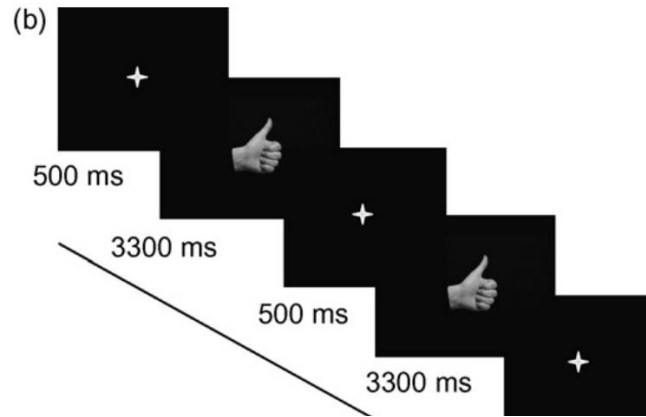
The AN group demonstrated opposite regional perceptual inaccuracy for their **perceived** body than HC



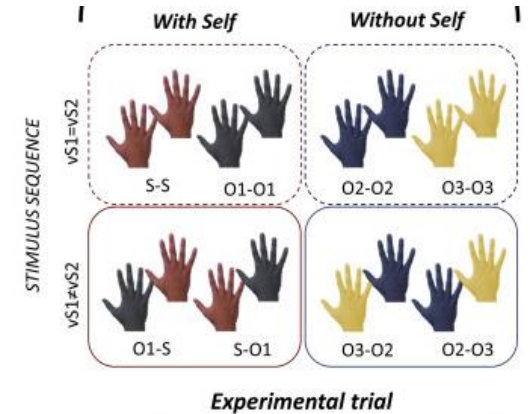
“Please use the sliders at the left to create what your body looks like today.”

Our study

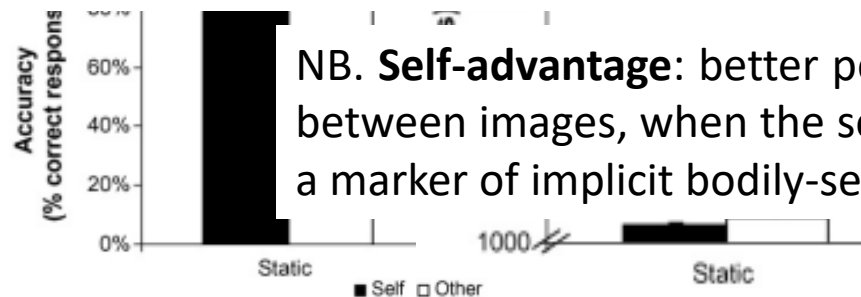
Investigate how body size misperception influences implicit bodily-self recognition



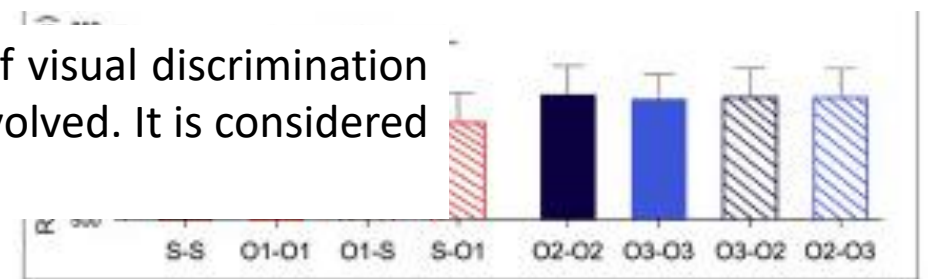
SELF-ADVANTAGE



Does self-identity rely more on how our body actually appears or on how we perceive it?



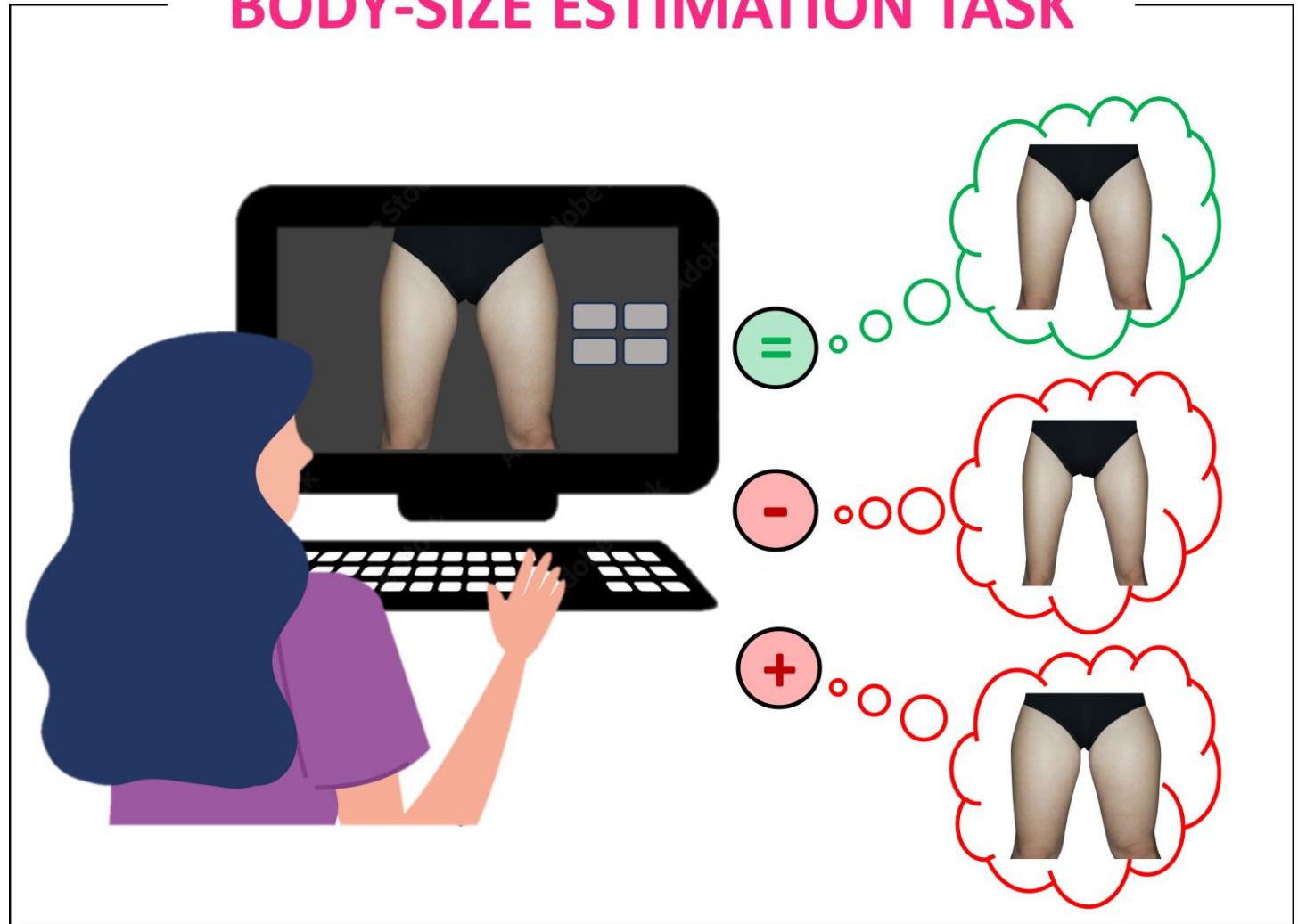
NB. **Self-advantage**: better performance tasks of visual discrimination between images, when the self-body parts is involved. It is considered a marker of implicit bodily-self recognition.



Galigani et al., 2021

Behavioral Study – BODY-SIZE ESTIMATION TASK

BODY-SIZE ESTIMATION TASK



50 healthy females

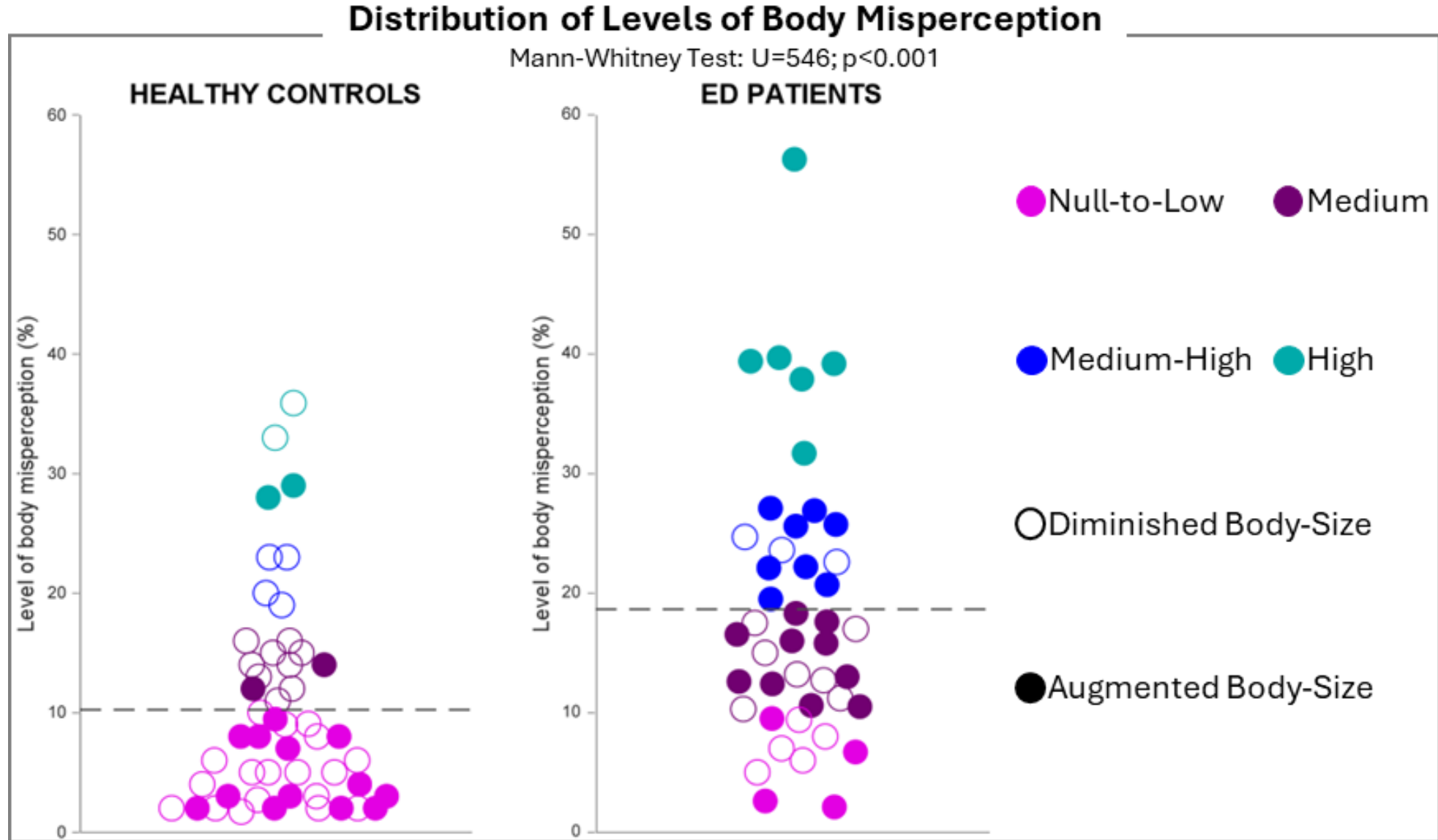
43 patients with Eating Disorders



2-task Experimental Paradigm

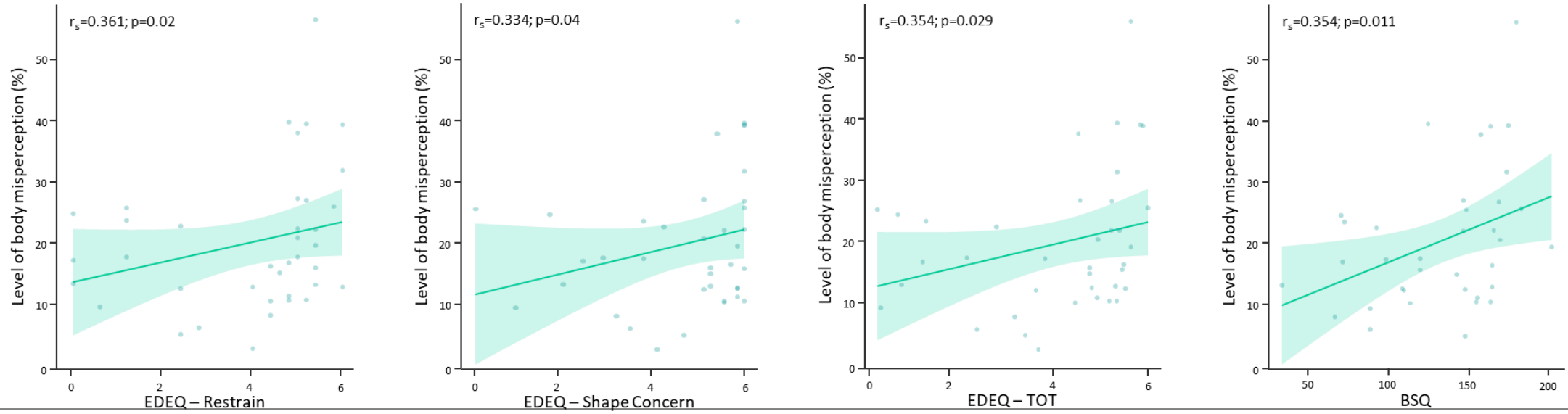
- 1) BODY-SIZE ESTIMATION TASK
- 2) VISUAL-MATCHING TASK

Body-size estimation task results



Body-size estimation task results

Correlation Analysis between Level of Body Misperception and Clinical Questionnaires in ED Patients



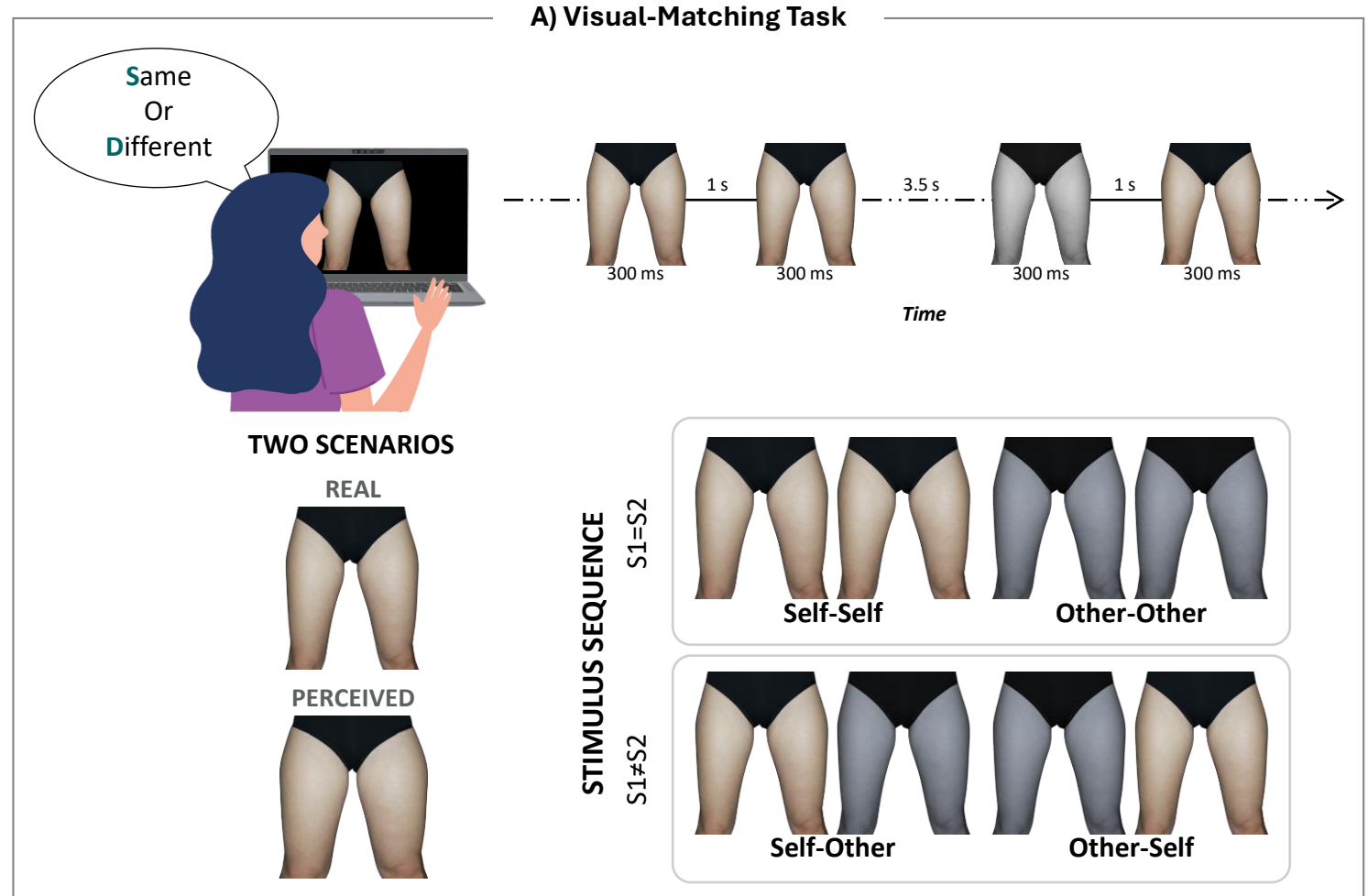
Behavioral study – VISUAL MATCHING TASK

50 healthy females
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2-task Experimental Paradigm

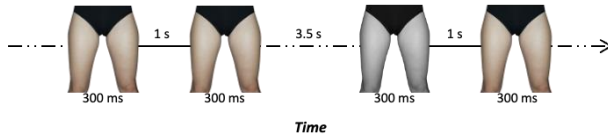
- 1) BODY-SIZE ESTIMATION TASK
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Behavioral study – VISUAL MATCHING TASK

A) Visual-Matching Task

Same
Or
Different



TWO SCENARIOS

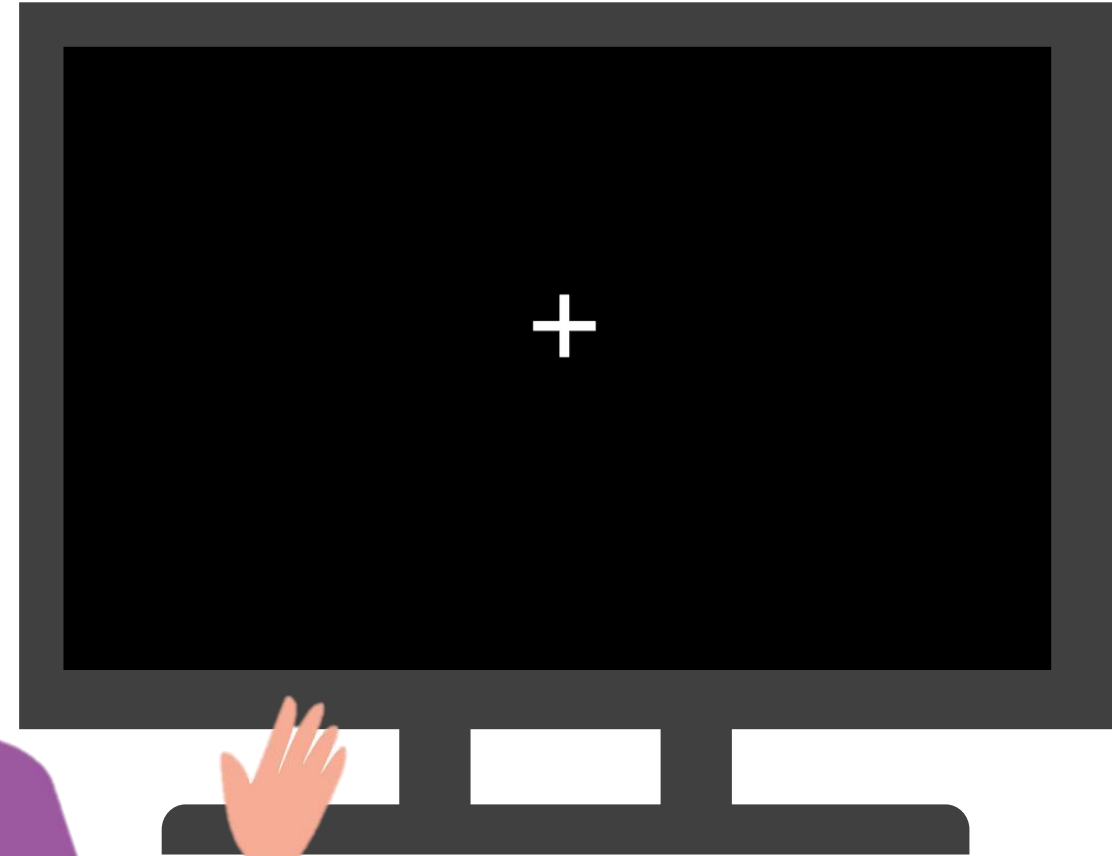
REAL



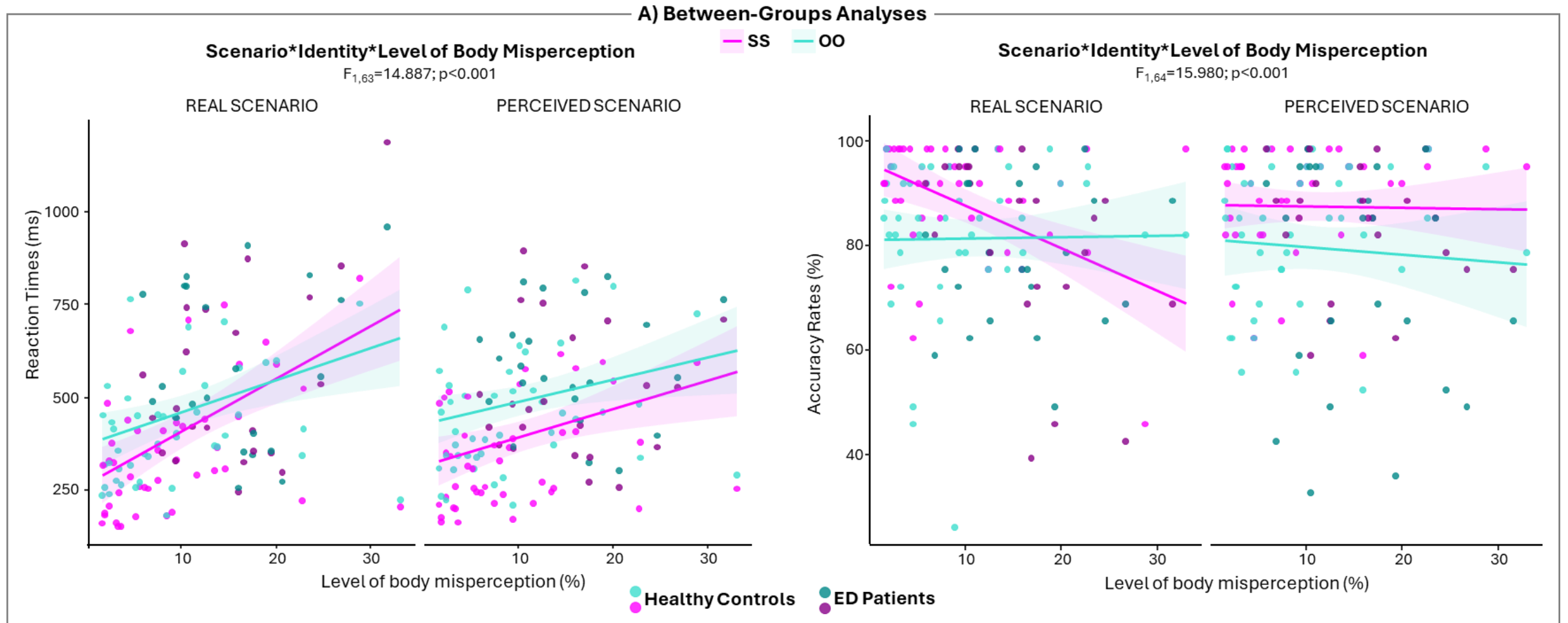
PERCEIVED



STIMULUS SEQUENCE
S1=S2
S1≠S2



Visual-matching task results

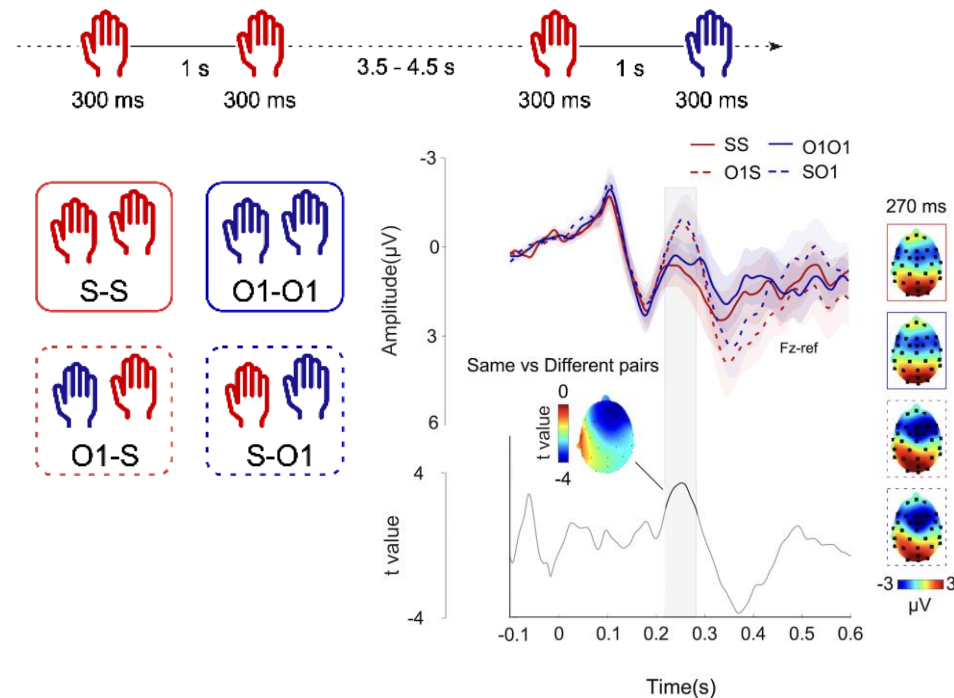


Electrophysiological study

Investigate how body size misperception influences implicit bodily-self recognition at the neurophysiological level

SELF-ADVANTAGE

ELETOPHYSIOLOGICAL EXPERIMENT

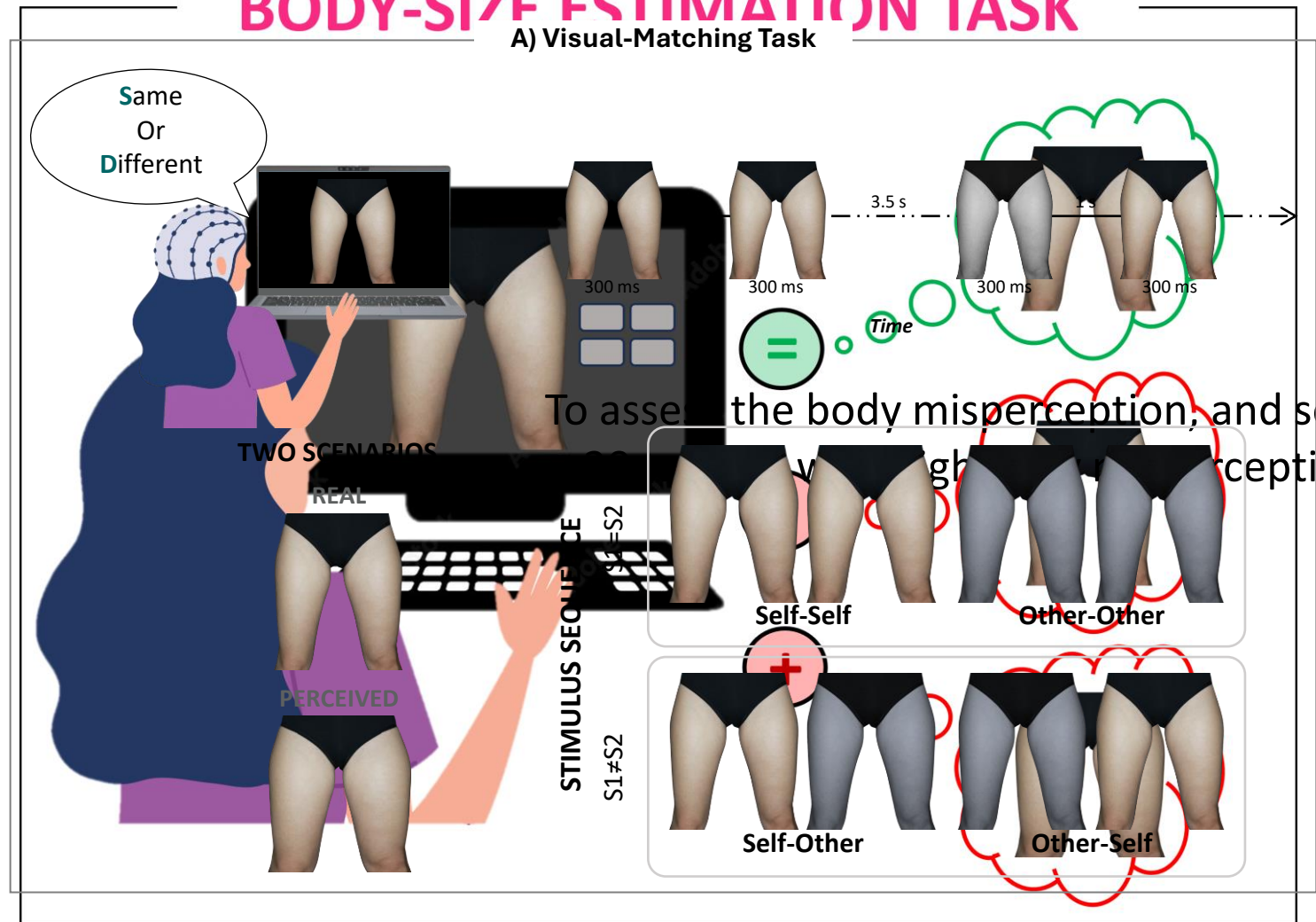


Galigani et al., *NeuroImage* 2025

Electrophysiological study

BODY-SIZE ESTIMATION TASK

A) Visual-Matching Task



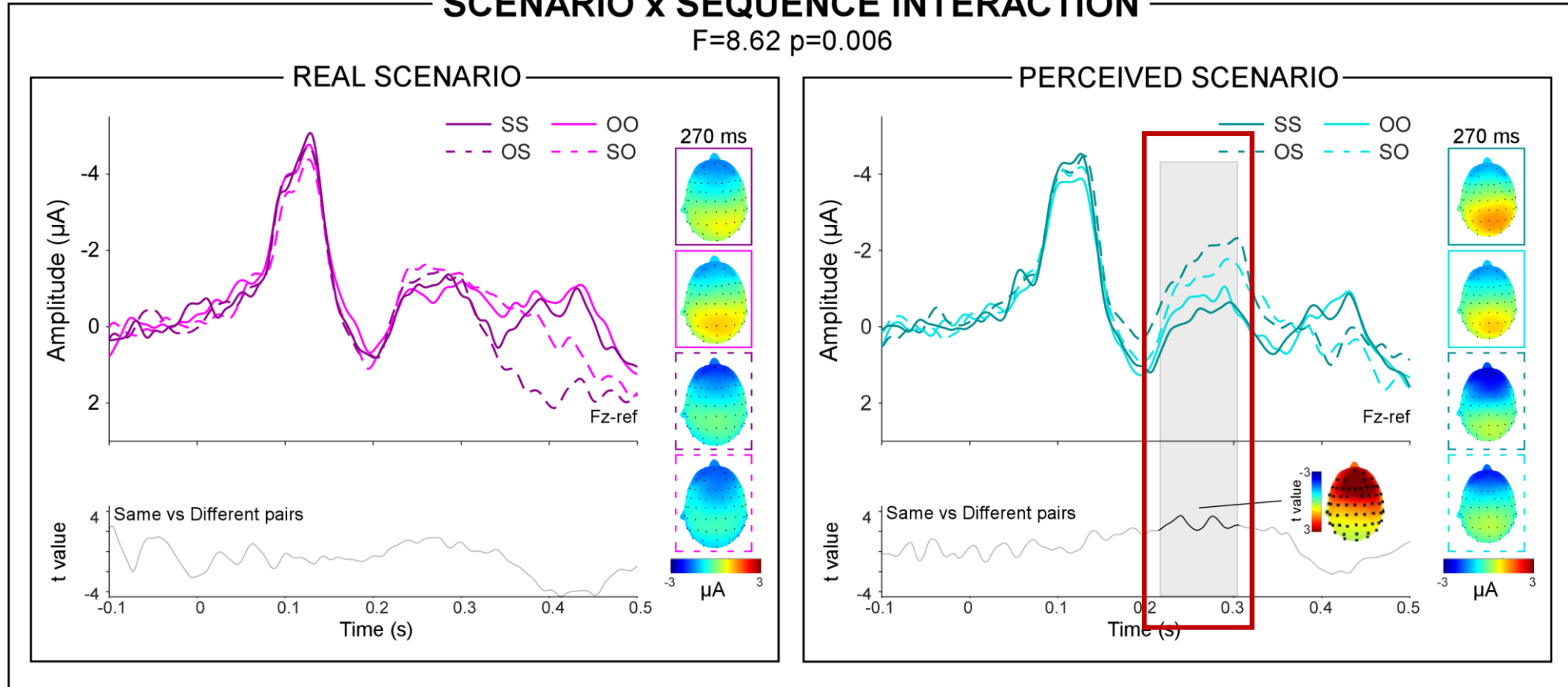
30 healthy women with high body misperception

To assess the body misperception, and select

Electrophysiological study results

SCENARIO x SEQUENCE INTERACTION

F=8.62 p=0.006



Take home messages!



Even healthy individuals may exhibit a distorted perception of the own body



Healthy controls with body misperception diminished their body-size, while ED patients with body misperception augmented it



Body-size misperception was predicted by ED symptomatology at the clinical questionnaires only in the ED patients group

Take home messages!



Regardless of the group membership (Healthy controls; ED patients), individuals with body-size misperception presented implicit self-recognition only when presented with the perceived body-image



EEG results parallel behavioral results, showing that implicit self-recognition is altered by body-size misperception also at the neurophysiological level



Body image perception exerts a top-down modulation over the bodily-self recognition mechanism at the behavioral and neurophysiological levels

What's next?

Body misperception emerges as a transdiagnostic factor, that shapes self-identity recognition mechanisms along a continuum from clinical traits to full-blown EDs



Body misperception can be considered a precursor of EDs



Raising awareness about body misperception in adolescence through the development of preventive educational interventions



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Thanks for your attention!



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