

# NO COUNTRY FOR OLD MEN? REDUCING AGEISM BIAS THROUGH VIRTUAL REALITY EMBODIMENT

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## INTRODUCTION

**Ageism is a negative attitude toward aging and elderly people** (Palmore, 1999). Many studies have investigated the effects of ageist attitudes and age stereotypes on the behaviour of others toward older persons and the self-related beliefs and behaviour of older adults themselves. **Attitudes and stereotypes could be explicit and implicit. Adults population show an implicit preference for younger population than older.**

Most dramatically, adults aged 60 and older showed a pro-young effect of similar magnitude to adults in their twenties, despite changes in explicit age preferences (Nosek et al. 2002). There is mounting evidence that virtual reality techniques can be used to produce a strong

ownership illusion over a virtual body (Ehrsson, 2008). Some evidence suggest that virtual alteration of skin color reduces implicit racial bias (Peck et al., 2013) and alteration of age features in an elderly person can reduce negative stereotypes toward the elderly (Yee & Bailenson, 2007).

**By embodying participants in same age and older bodies by visuo-tactile synchrony stimulation, we aimed to induce a body-illusion ownership and test whether we could reduce negative implicit bias toward elderly people in young adults.**

## MATERIALS AND METHODS

### SAMPLE

24 participants (12 males, mean age 23,75±2,308), students of the University of Milan- Bicocca, took part in the experiment. They were all Italian speaker and have no history of psychiatric or neuropsychological disorders.

### EXPERIMENTAL DESIGN

		VIRTUAL HAND POSITION	
		ANATOMICAL	NON ANATOMICAL
VIRTUAL HAND AGE	YOUNG		
	OLD		
		EMBODIMENT	NON EMBODIMENT

### STIMULI

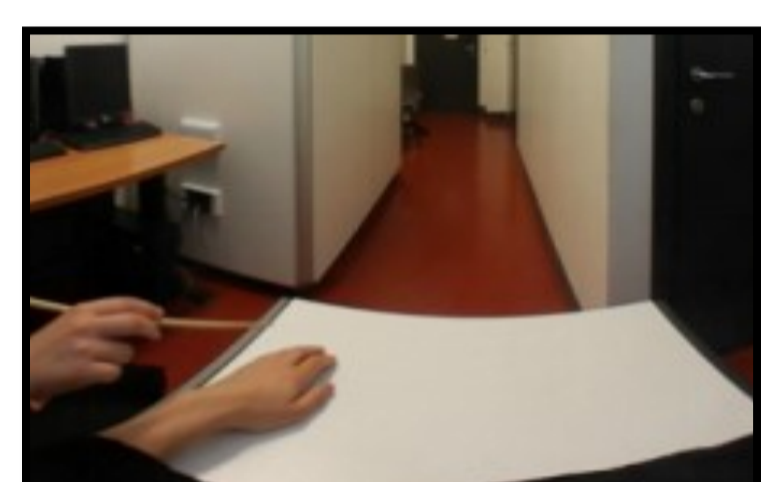


Fig. 1

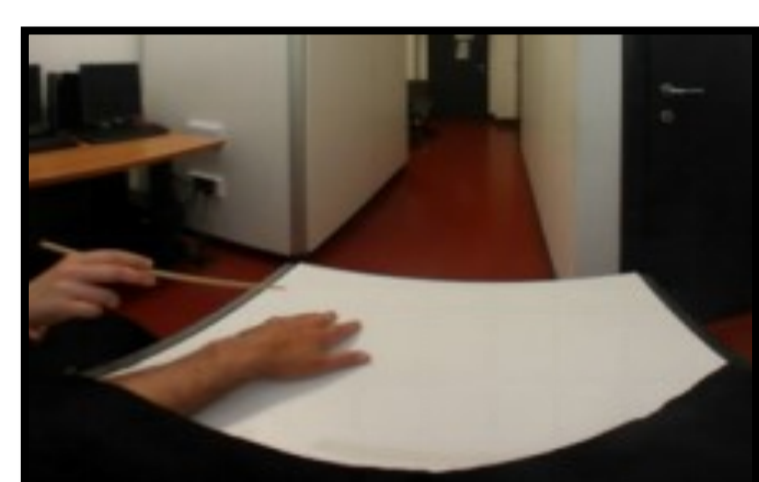


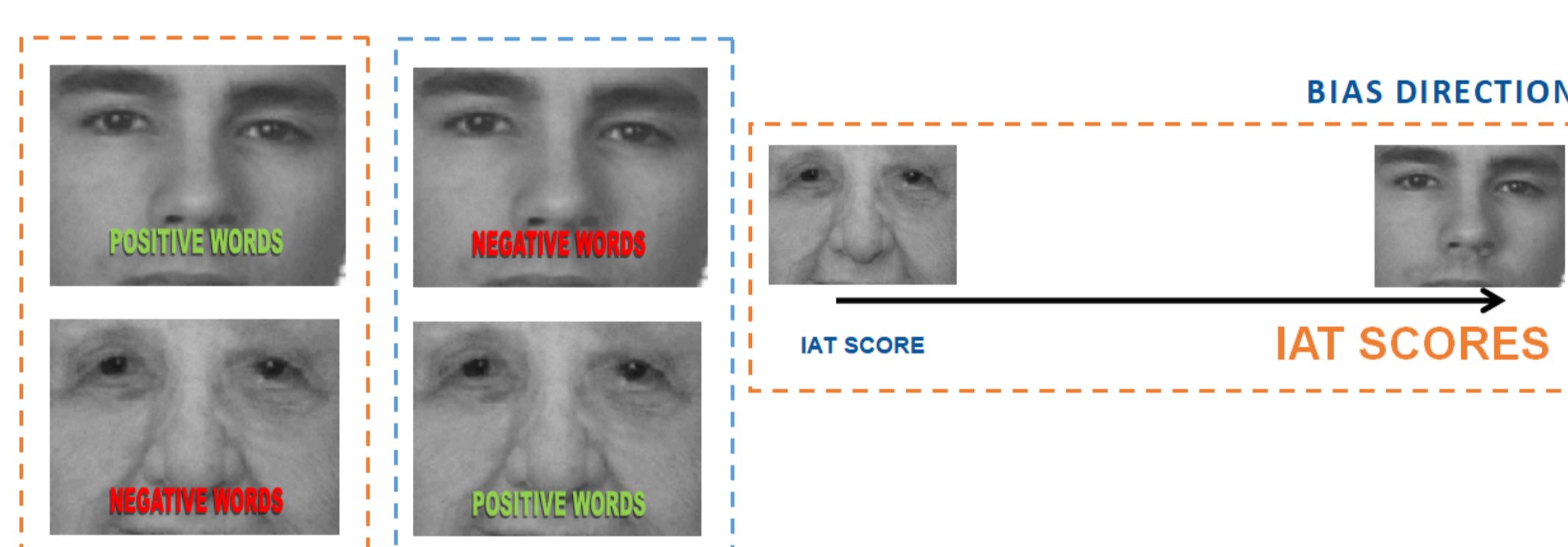
Fig. 2

Videos for virtual reality were recorded with a Samsung Gear 360 @ in the N-VISION Lab of the department of Milan- Bicocca. Avatars are two different males real person. We taped 30 (fig 1) and 60 (fig. 2) years old hands, touched by a wooden stick every second for 120 seconds. Their arms were extended in front of participant, perpendicularly to the coronal plane. We used the same video, for anatomical and non-anatomical conditions but in the non-anatomical one the videos showed a 45° shift of view point (visuo-proprioceptive inputs non-overlapping).

### PROCEDURE

Before the stimulation	Embodiment stimulation	After the stimulation
Age Implicit Association Test (PRE-IAT) Fraboni Ageism Scale	Visuotactile stimulation for each condition Participants had their arm perpendicularly extended	IAT (post-IAT) Embodiment Questionnaire

### RT BLOCK 1—RT BLOCK 2 = IAT



## CONCLUSION

The study substantiates that a **visuotactile stimulation in Virtual Reality could be a valid method to induce an old body-illusion ownership.** Moreover we found a reduction of **implicit age bias.**

However the study did not show any effect of **explicit embodiment in reducing ageism bias.**

The main effect of HAND AGE is in line with previous study in which **exposure to a stereotypic exemplar reduce implicit prejudice** (Dasgupta & Rivera, 2008).

Future studies will aim to investigate this effect in **elderly people** in increasing positive self perception of aging.

## REFERENCES

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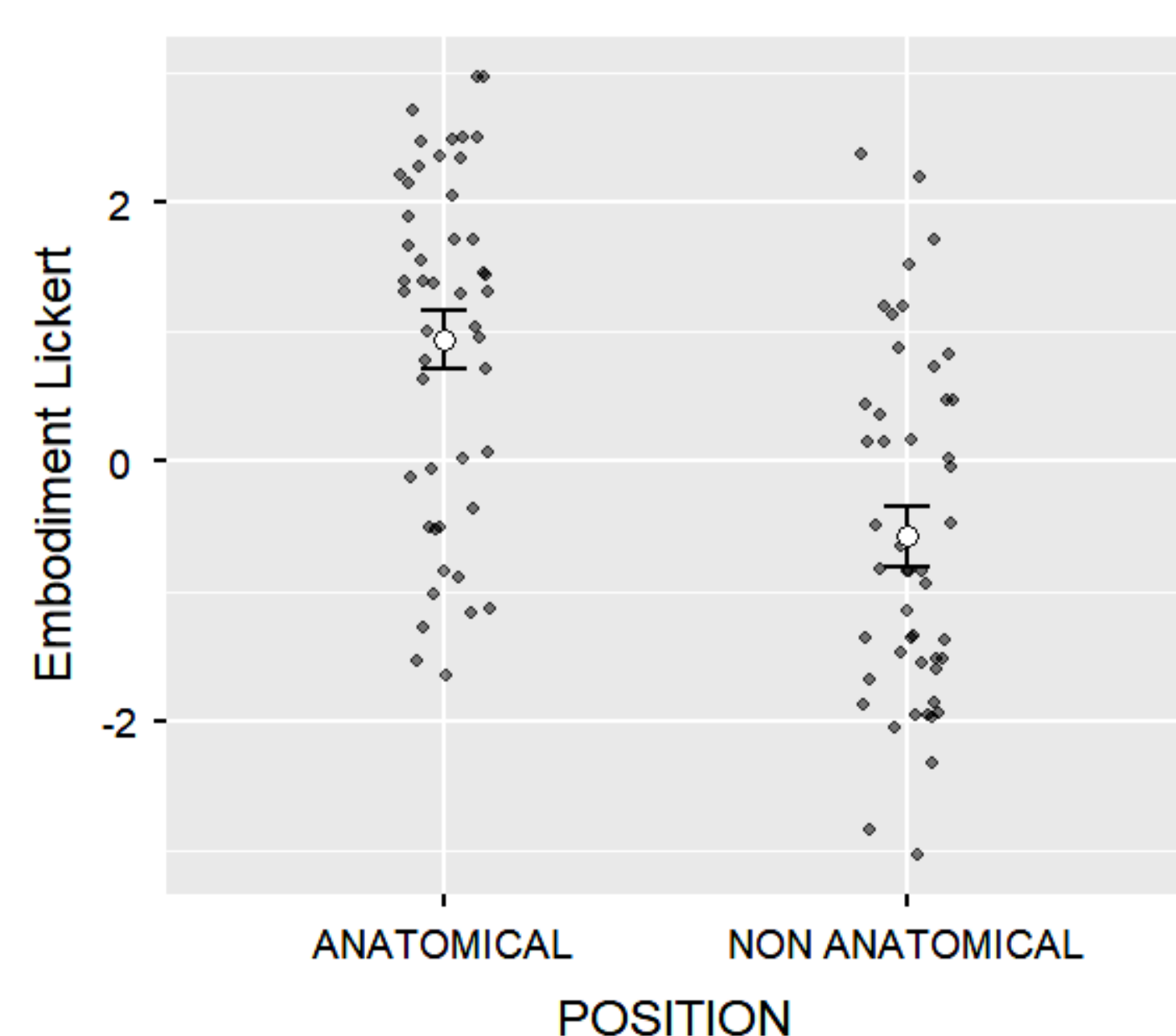
We expected a significant higher scores of Embodiment Questionnaire only for the **Anatomical condition** (in both Young and Old Hand Conditions).

We used as measure of implicit ageism  $\Delta$ IAT (preIAT- post IAT), where a greater score suggests a decrease of negative attitudes toward elderly. We expected a greater  $\Delta$ IAT in **Old Hand Anatomical condition.**

## RESULTS

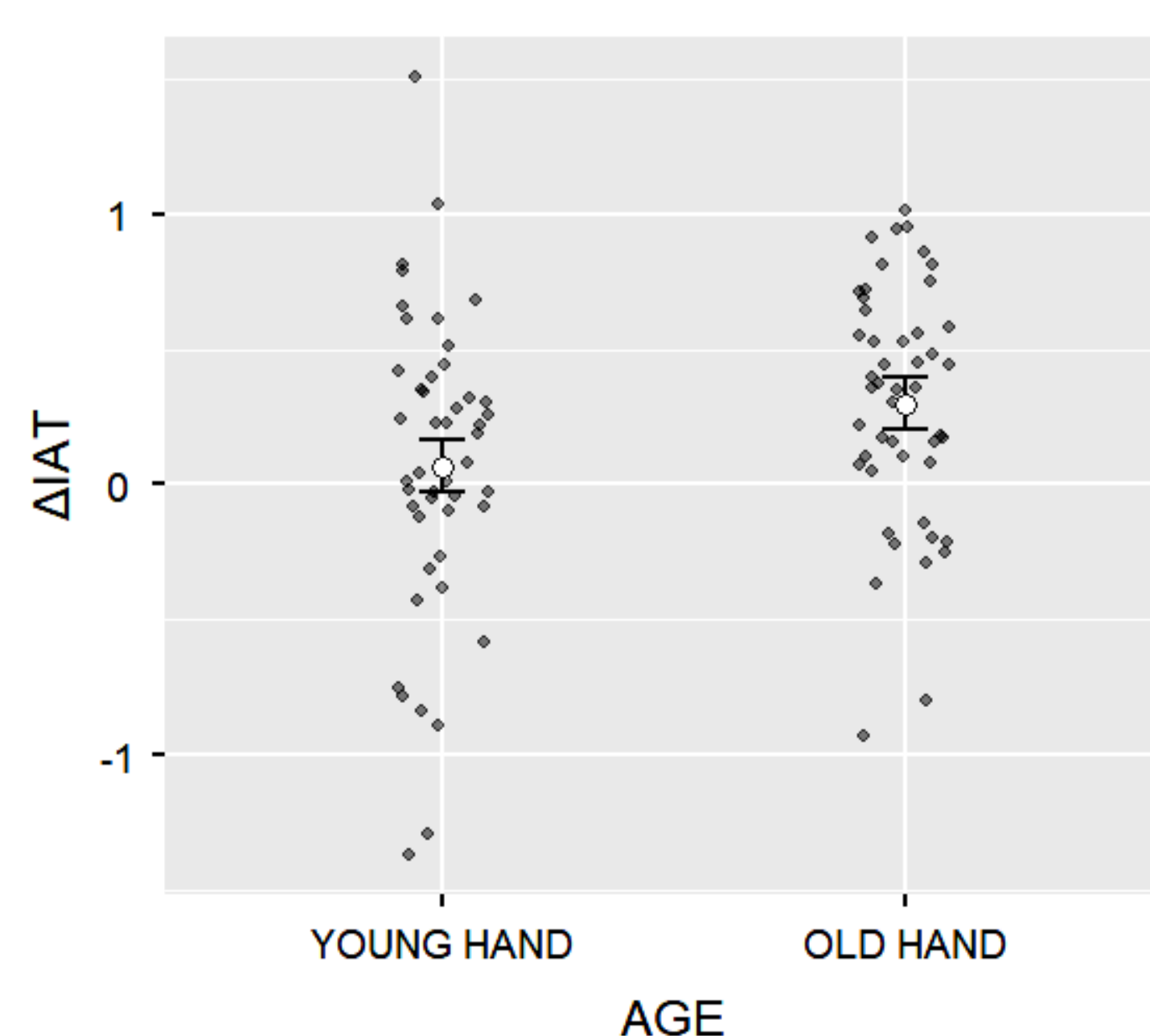
### EMBODIMENT CONDITION

We conducted a Repeated Measure ANOVA with Embodiment as dependent variable and **HAND AGE** and **POSITION** as within factors. We found a main effect of **POSITION** ( $F(1,23)=30.686, p<0.0001, \eta^2=0.572$ ).



### AGE IMPLICIT BIAS

We conducted a Repeated Measure ANOVA with  $\Delta$ IAT as dependent variable and **HAND AGE** and **POSITION** as within factors. We found a main effect of **HAND AGE** ( $F(1,23)=9.013, p=0.006, \eta^2=0.282$ ), but no interaction effect.



### EXPLICIT AGEISM

We conducted a Repeated Measure ANOVA with Fraboni score and its subdimensions as dependent variable. We found a main effect. ( $F(2,20.5)=30.686, p<0.0001, \eta^2=0.471$ ). Our sample shows higher stereotypes and discrimination traits.

