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Virtual social interaction and its applications in health and healthcare

Real social interaction?

Google

real social interaction

human | technology | mental health | virtual reality | human interaction | sociology | reduce stress | games | physica

Mercy Medical Center

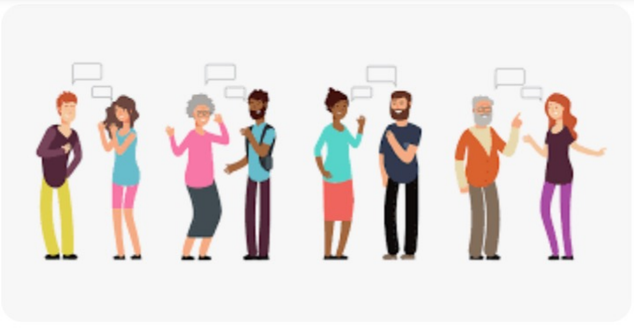
Health Benefits of Social Interaction ...

Adam Eason

The Health Benefits of Real-Life Social ...

LinkedIn

Social Interactions in Social Psychology



GeekWire

Real human interaction still preferred ...

Hindustan Times

vogue despite the social media craz...

Dana Foundation

Hard-Wired for Social Relationships ...

Plan2Play

Are Social Interactions Good for You ...

CK12-Foundation

Types of Social Interaction | CK...

Clarity Clinic

Social Relationships ...

saylordotorg.github.io

Social Interaction in Everyday Life

SimpleUsability

The Murray Valley Standard

Publishing Services - University of Mi...

LinkedIn

SteadyHealth.com

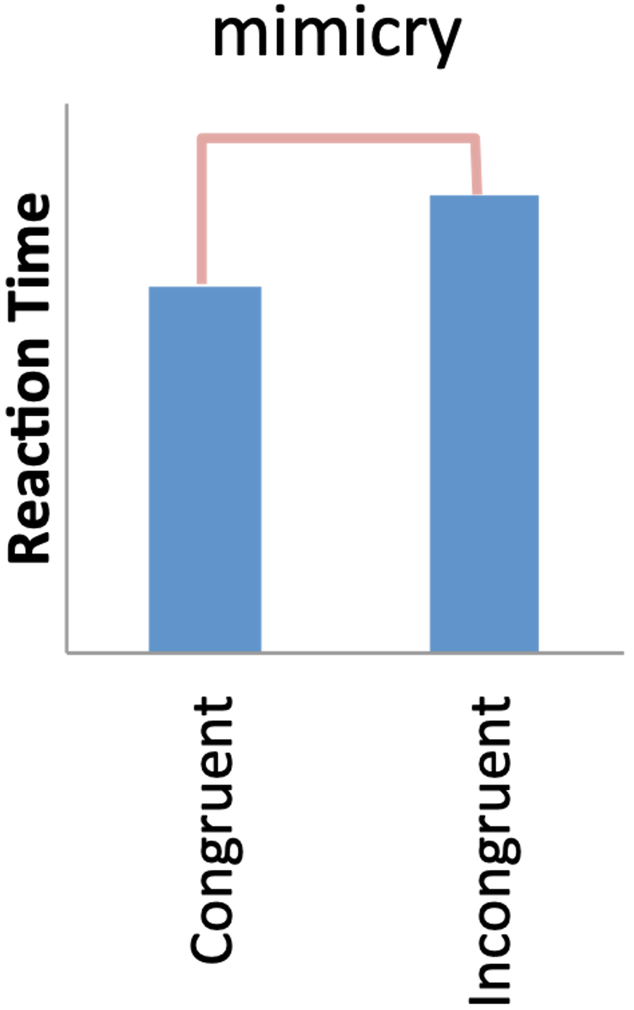
Physically together, virtually apart


VIRTUAL SOCIAL INTERACTION
ME
REAL SOCIAL INTERACTION
imgflip.com

Automatic Imitation

Congruent

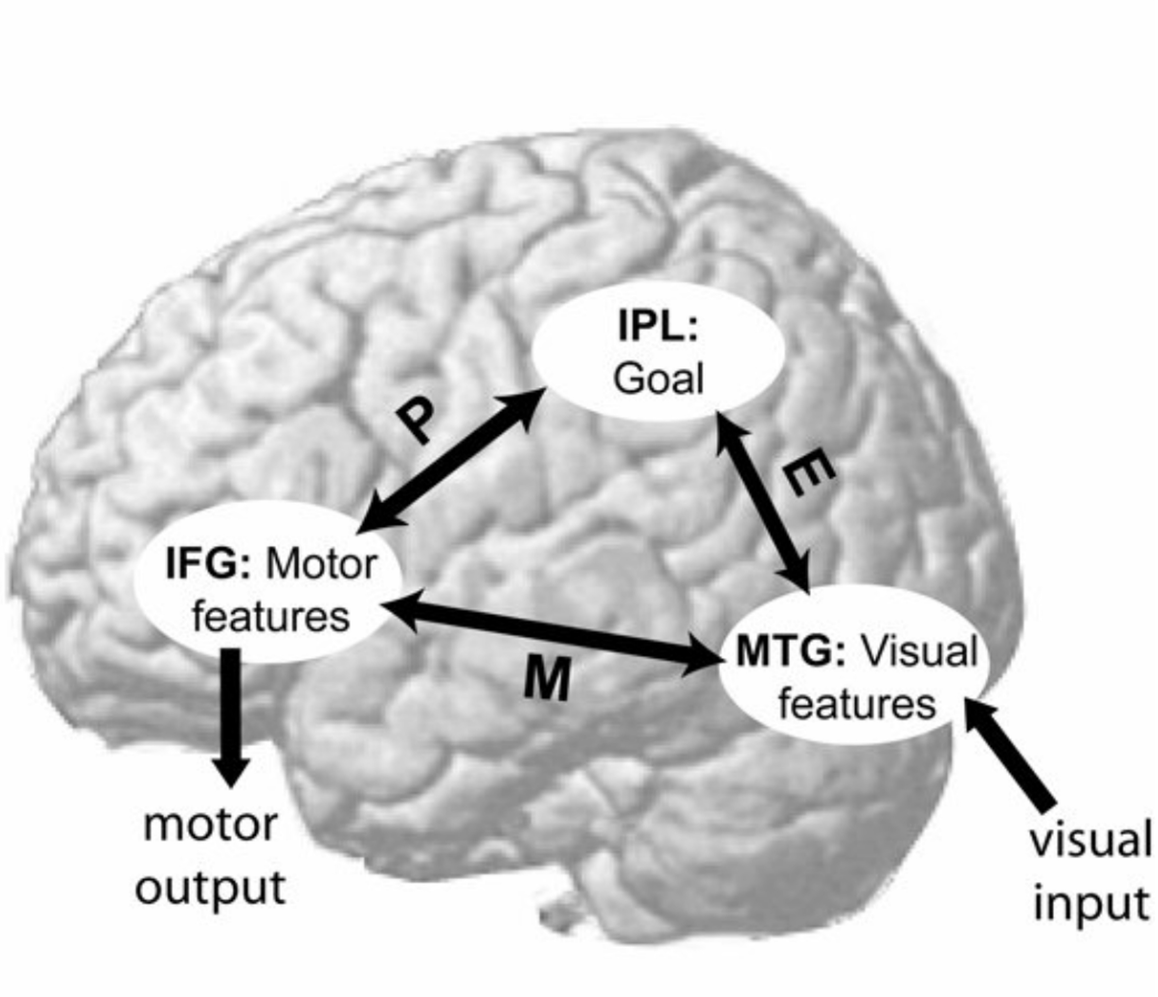
Incongruent



Heyes et al. *Cognitive Brain Research* 2004

"*The Unbearable Automaticity of Being*"

- Bargh and Chartrand, 1999

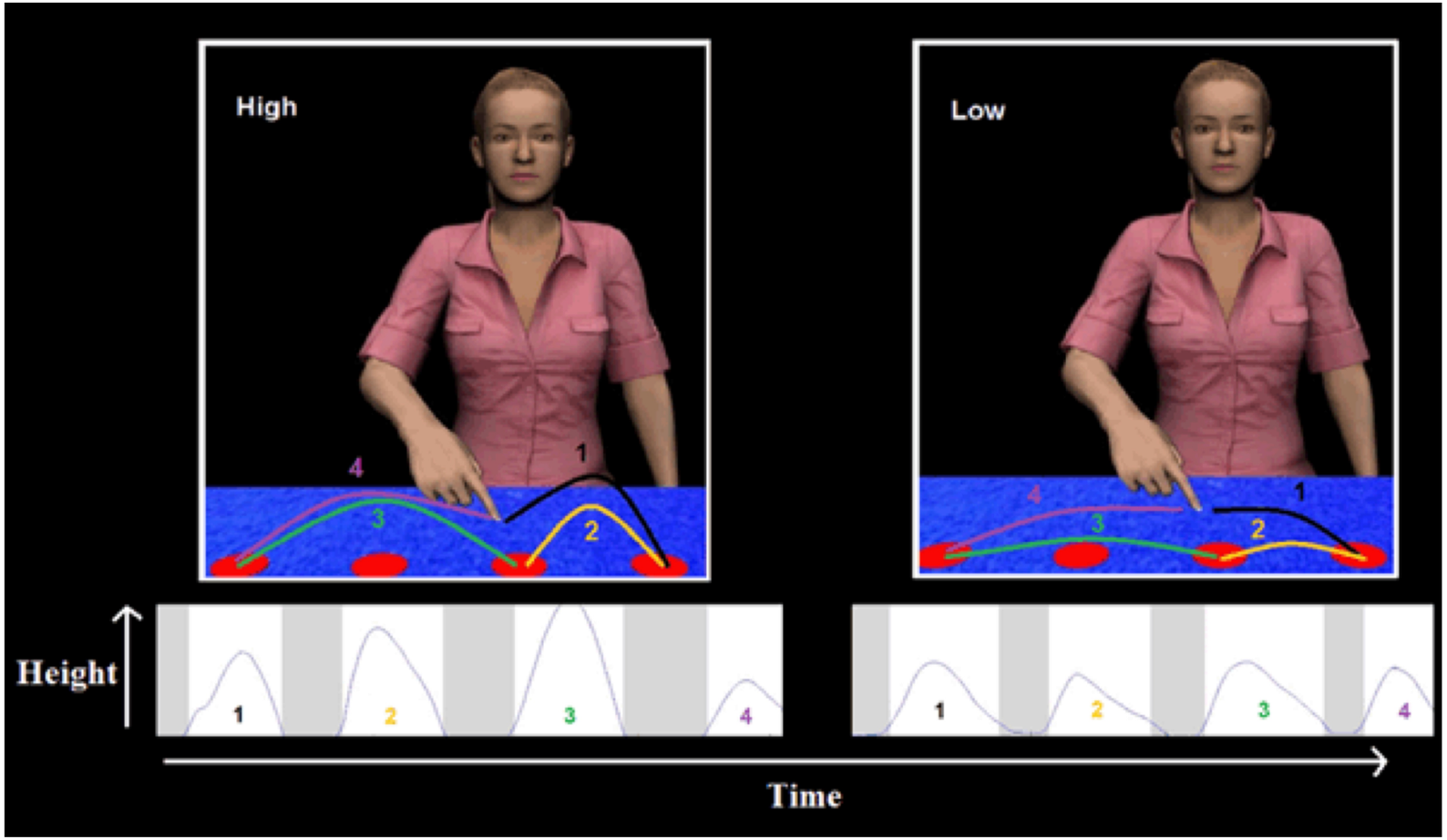


Mimicry: implicit and automatically copying the detailed kinematic features of an observed action, rather than just the action goal.

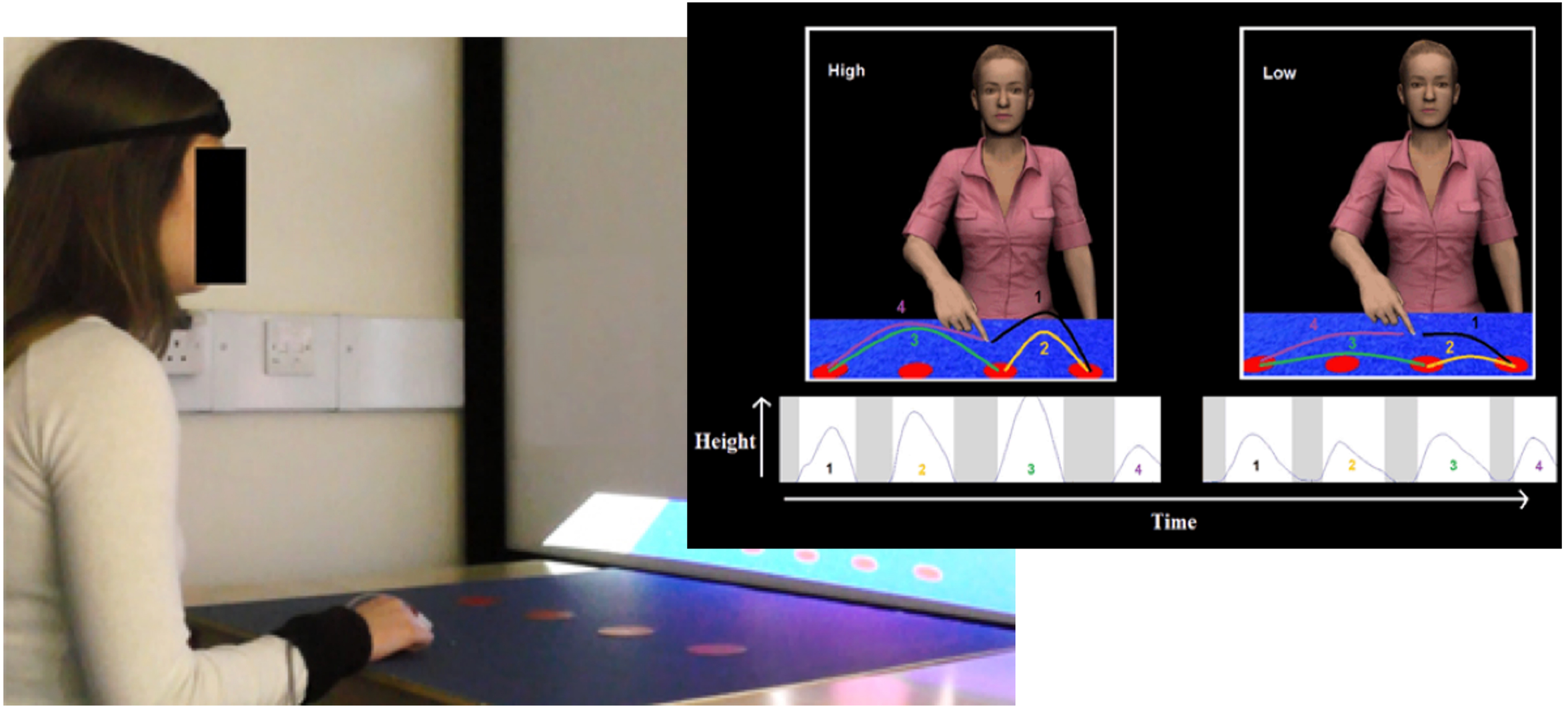
Emulation: copying the explicit goal of an observed action

Hamilton, *Q J Exp Psychol,* 2008

Dr Paul Forbes

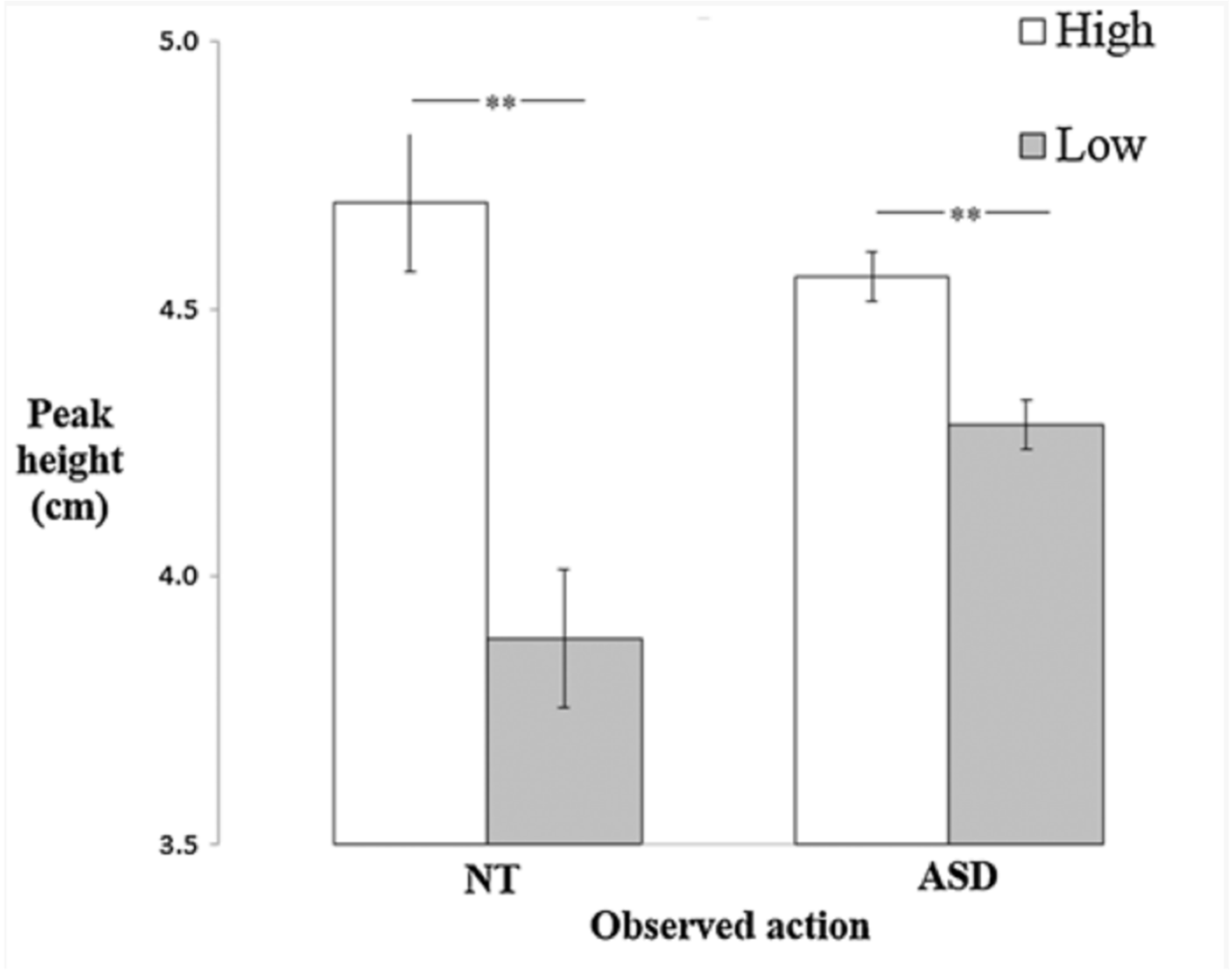


Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016



Both neurotypical and ASD participants

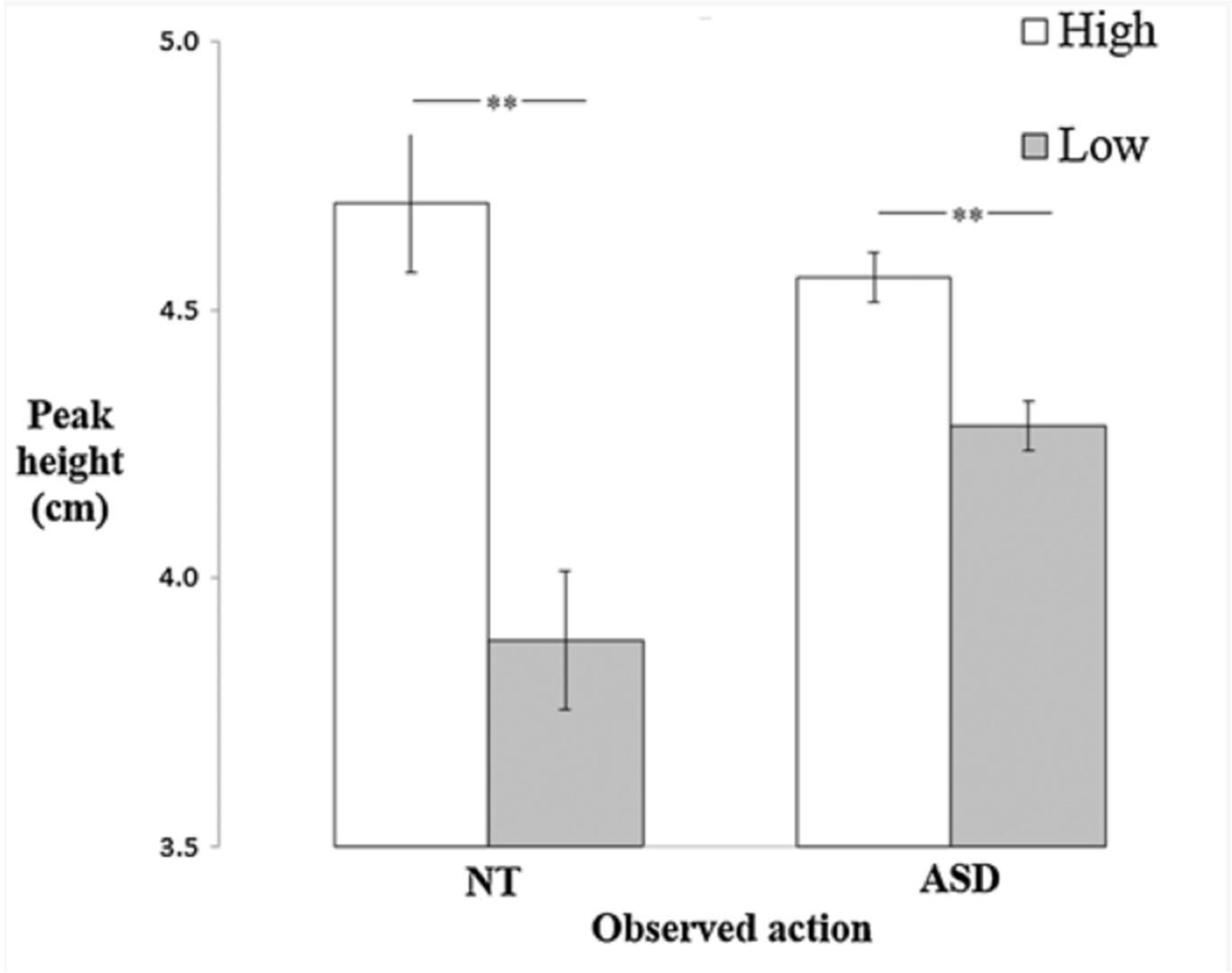
Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016



Height: $p < 0.001$

Height x Group: $p = 0.051$

Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016

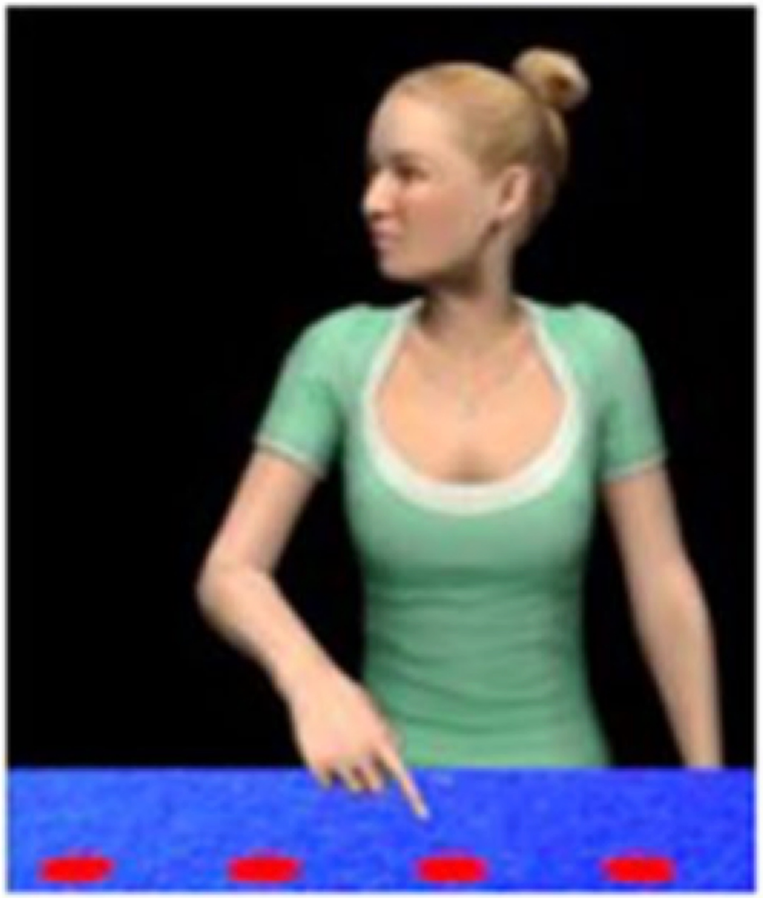


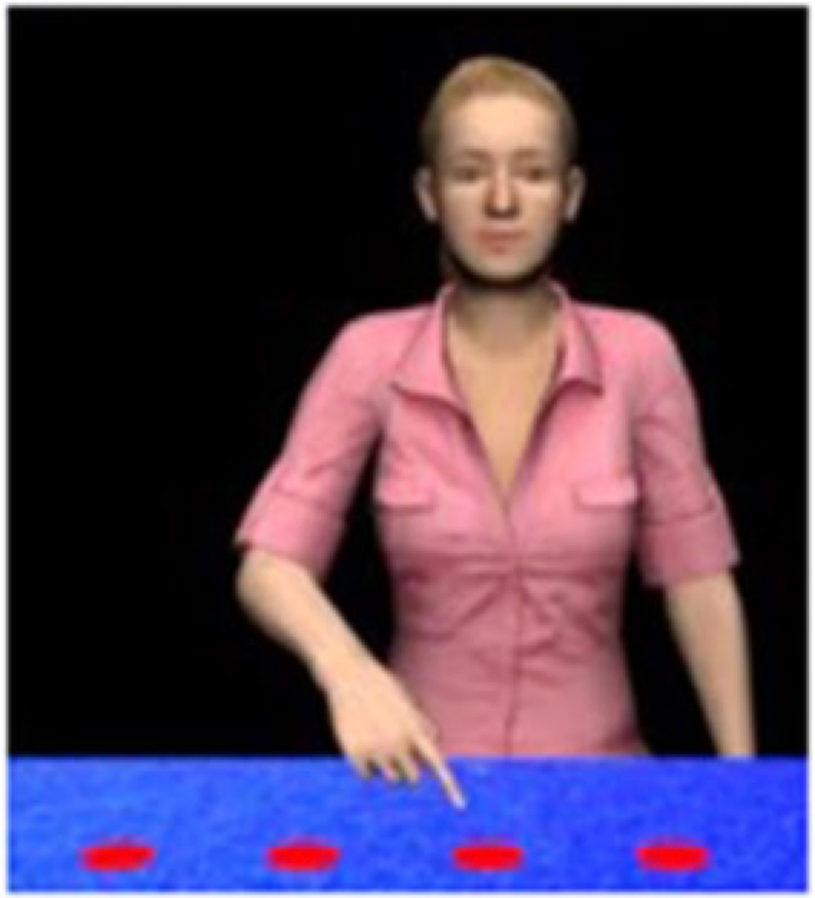
- Height: $p < 0.001$
- Height x Group: $p = 0.051$

- In both group there is evidence for mimicking;
- ASD mimicked less.

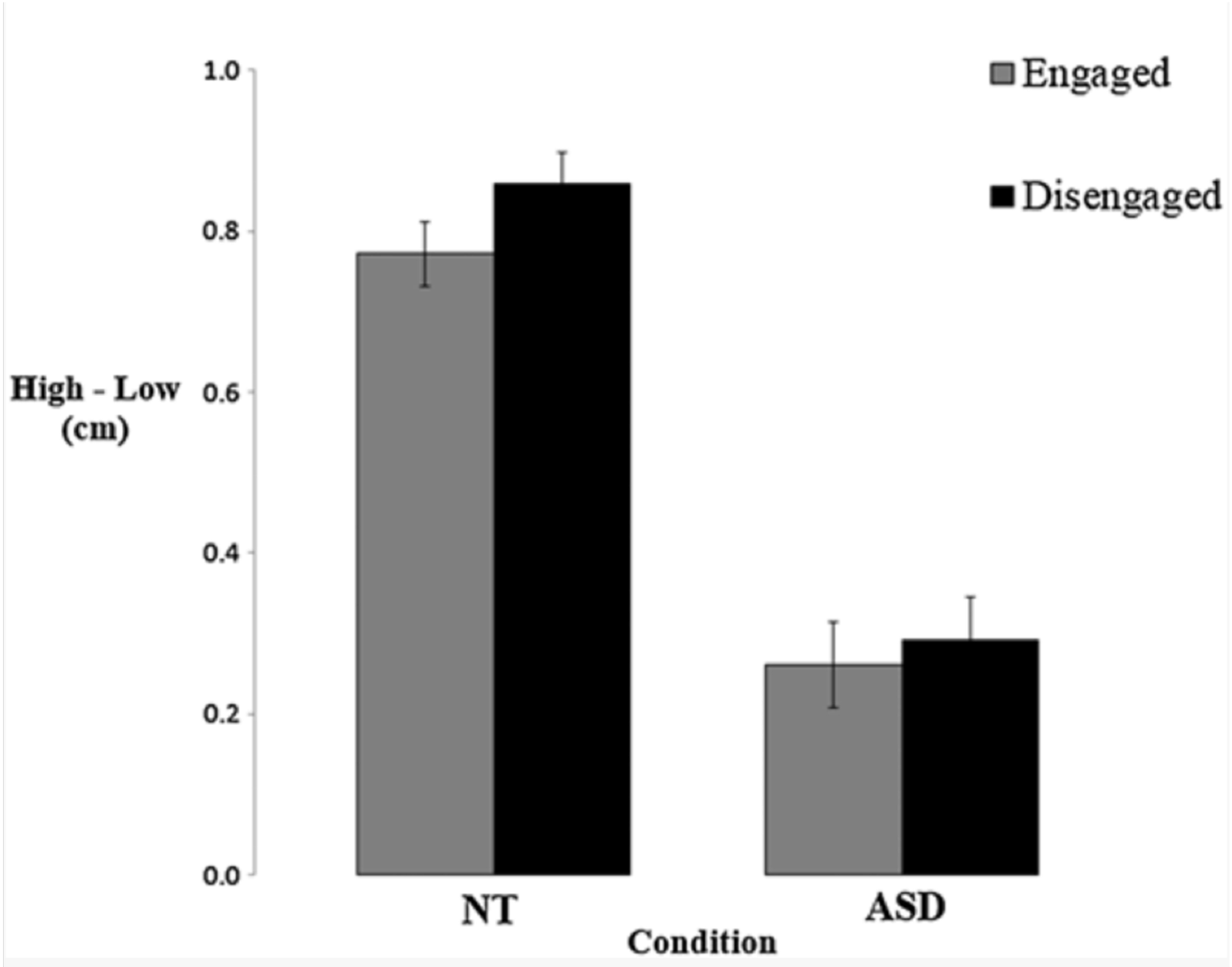
Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016

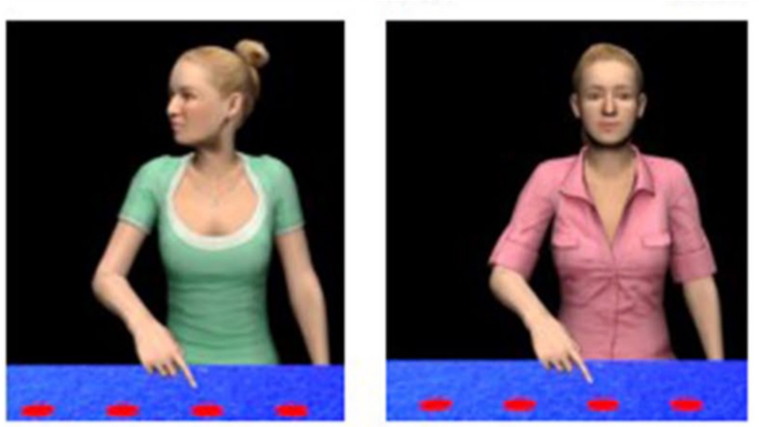
Engaged and disengaged



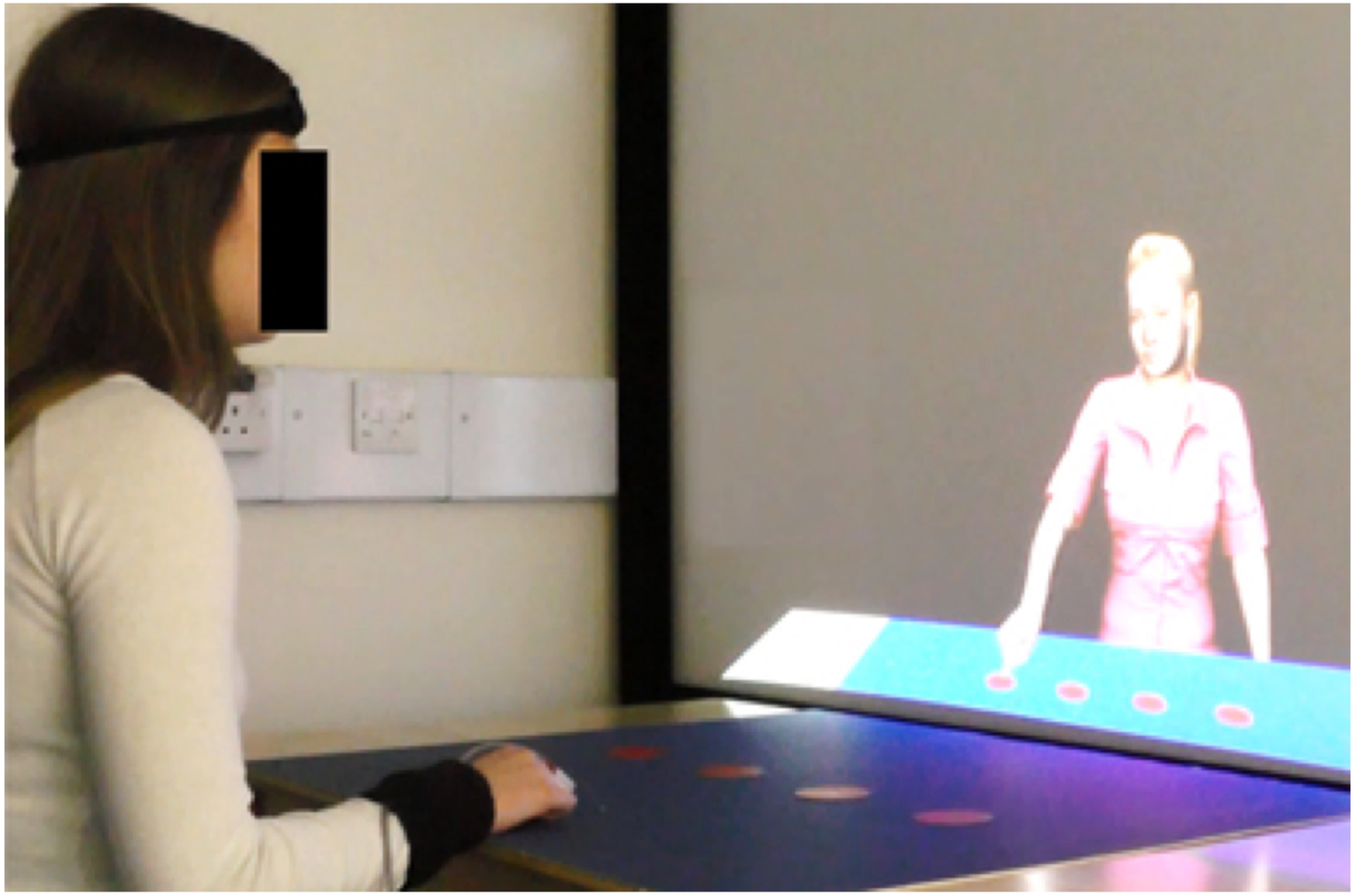


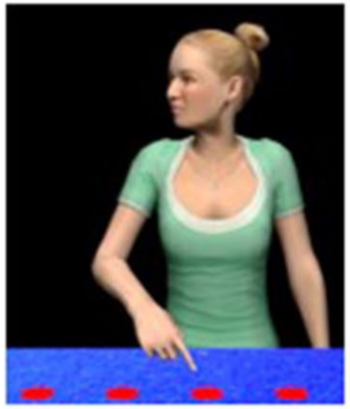
Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016

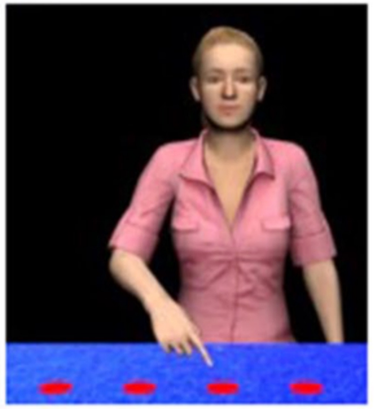




Forbes, Pan, & Hamilton, *J Autism Dev Disord*, 2016







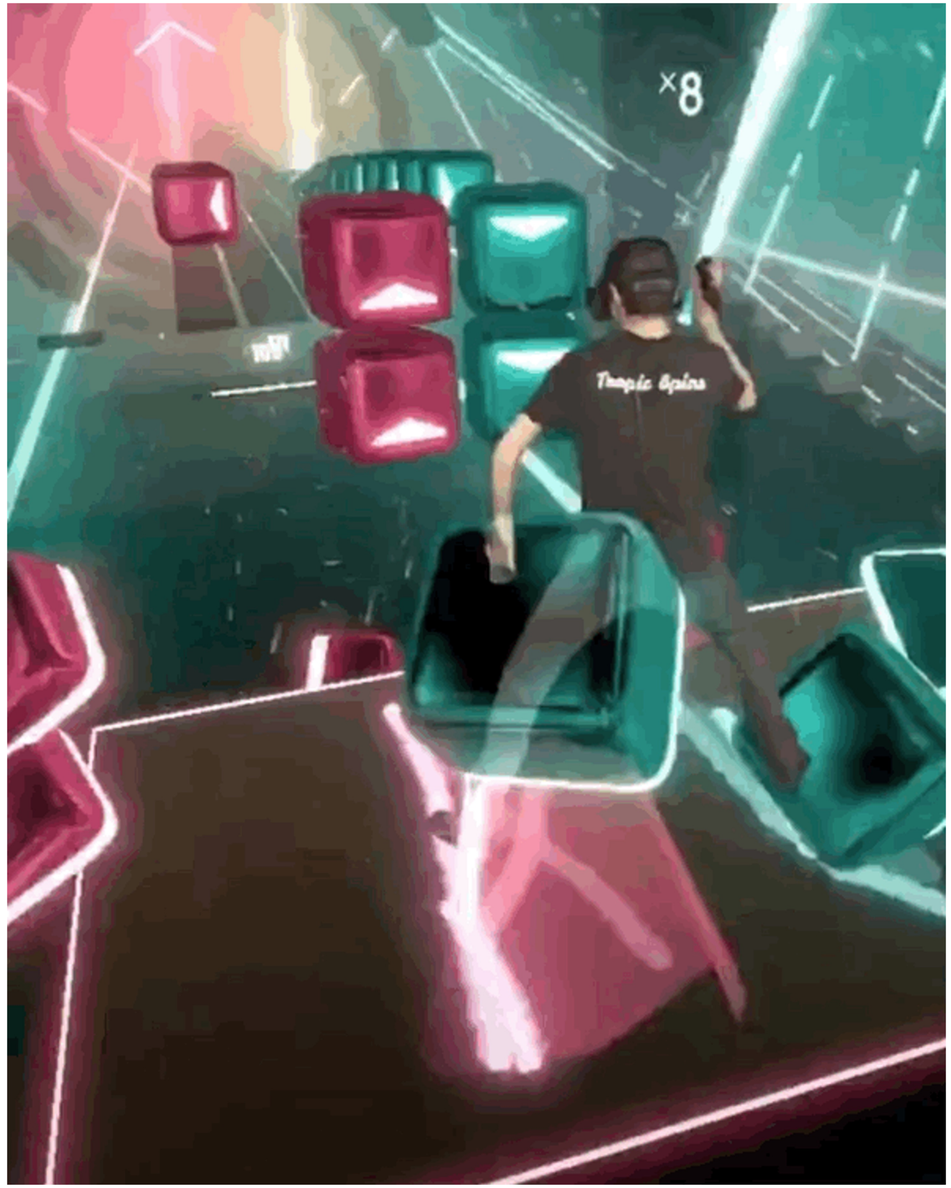
VR is an illusion

- 3D vision
- Surrounding
- Sensori-motor contingency

- Prof Mel Slater 2009

@panxueni

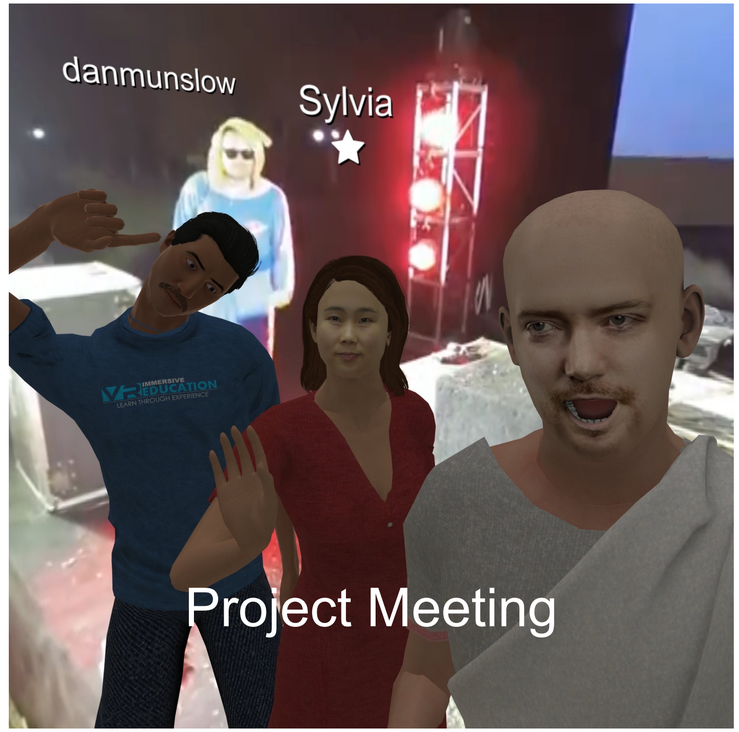
VR is an illusion

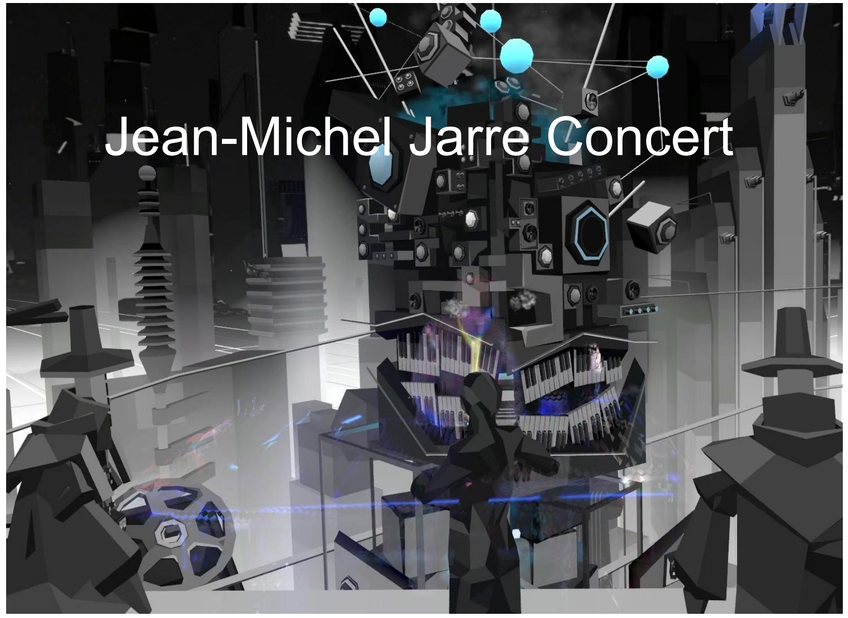


@LSToast


MARCOGILLIES
BEYOND 2020
WHERE CREATIVITY MEETS R&D
ELAINE-WONG
DR DOM
GABBSY
DREWCHIT
PANXUENI
COMPETITION
UPDATES
J K L


Student Welcome Week


danmunslow
Sylvia
Project Meeting


Jean-Michel Jarre Concert


Share
Maria Murci
sylvia pan
IEEE
March 22nd - 26th
Doctoral Consortium Sponsors
Contest Sponsors
Fakespace Labs
International Conference Social


Lab Social

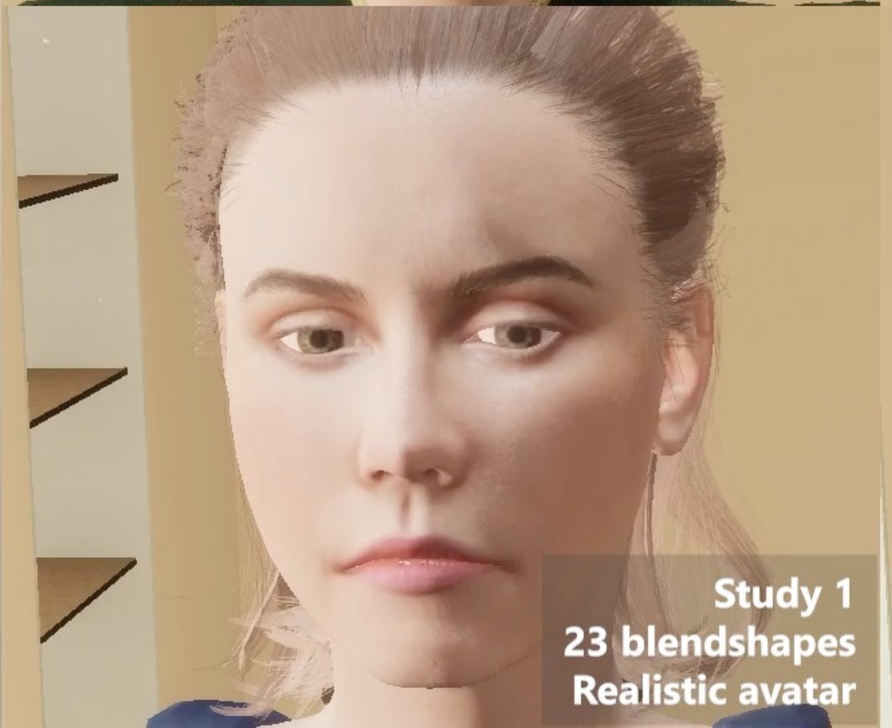
Social VR: physically apart, virtually together

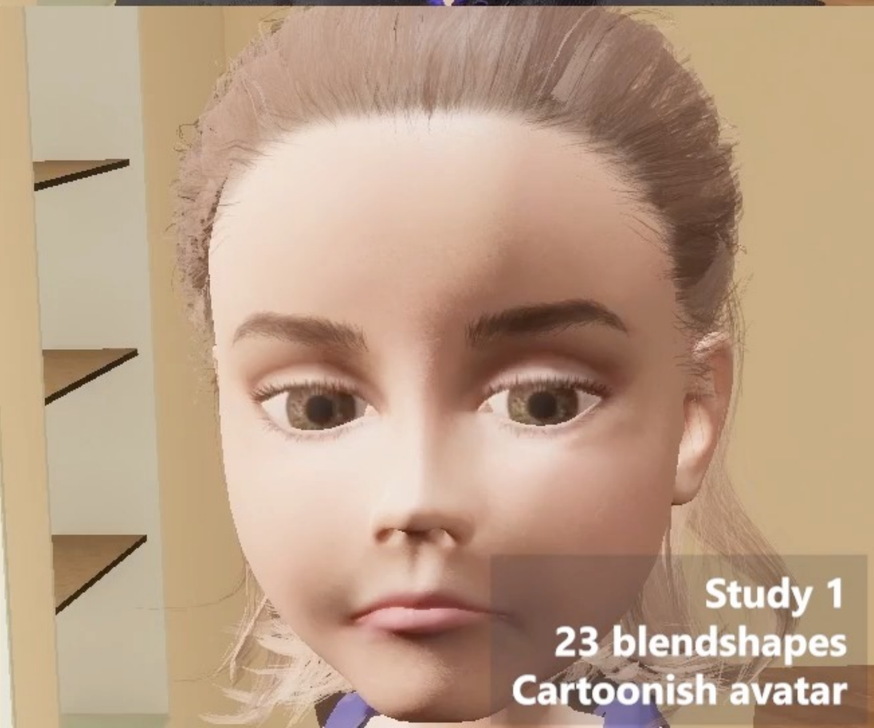
@panxueni

Collingwoode-Williams et al, 2021

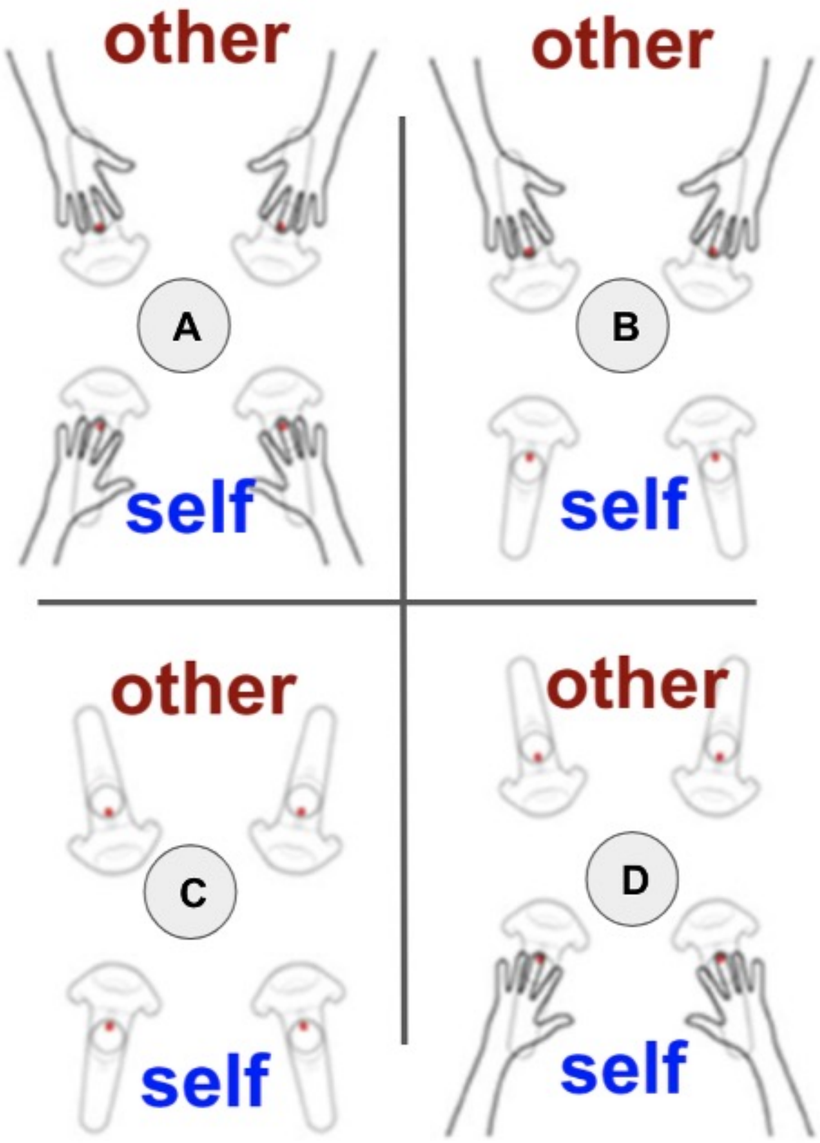
Expressive Self-avatar

Ma & Pan IEEE VR 2022





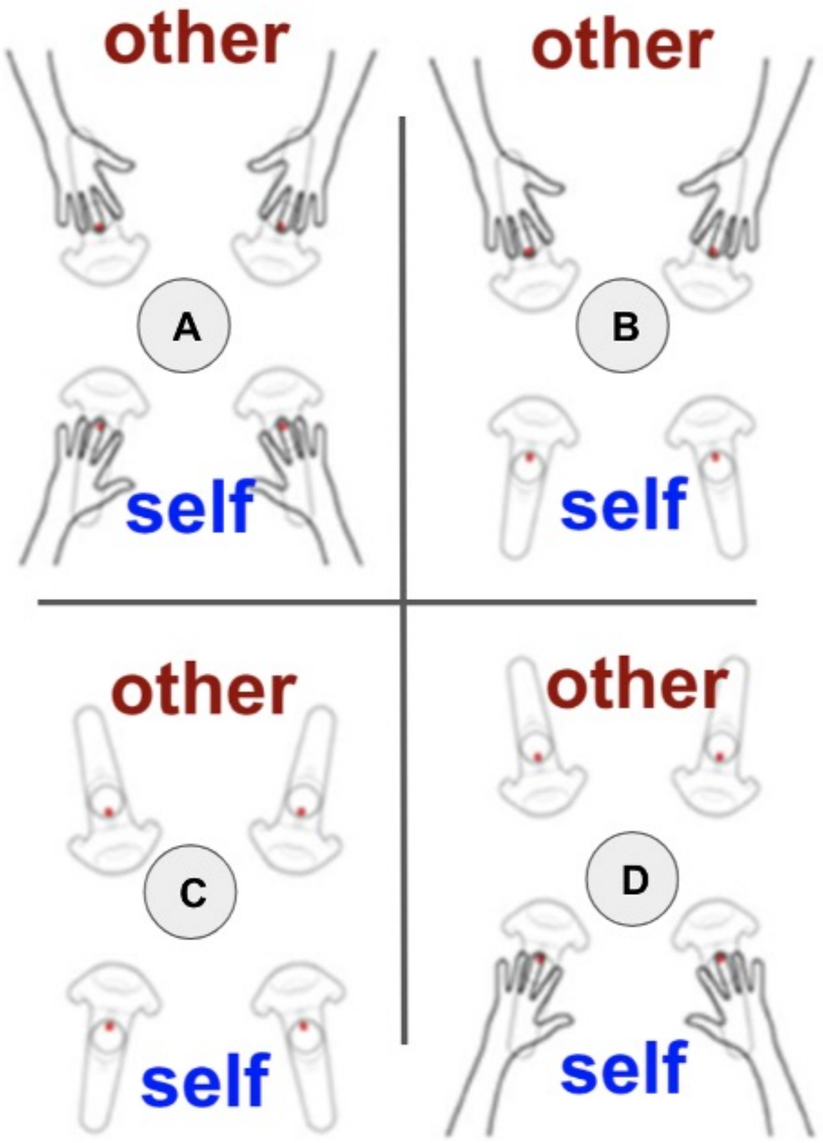
Different configuration -> psychological impact



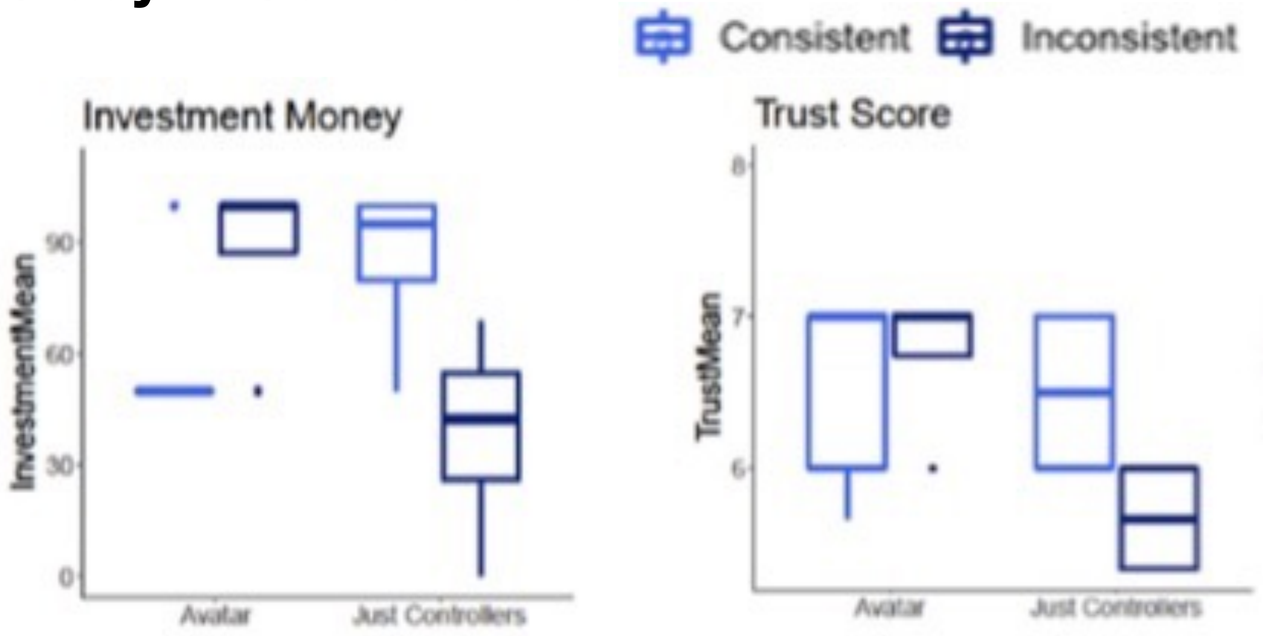
2x2 design:
Self representation (Just hands vs full body)
Consistency (consistent vs inconsistent)

DV: Trust (trust game, questionnaires)

Collingwoode-Williams et al. 2021, Frontiers in VR

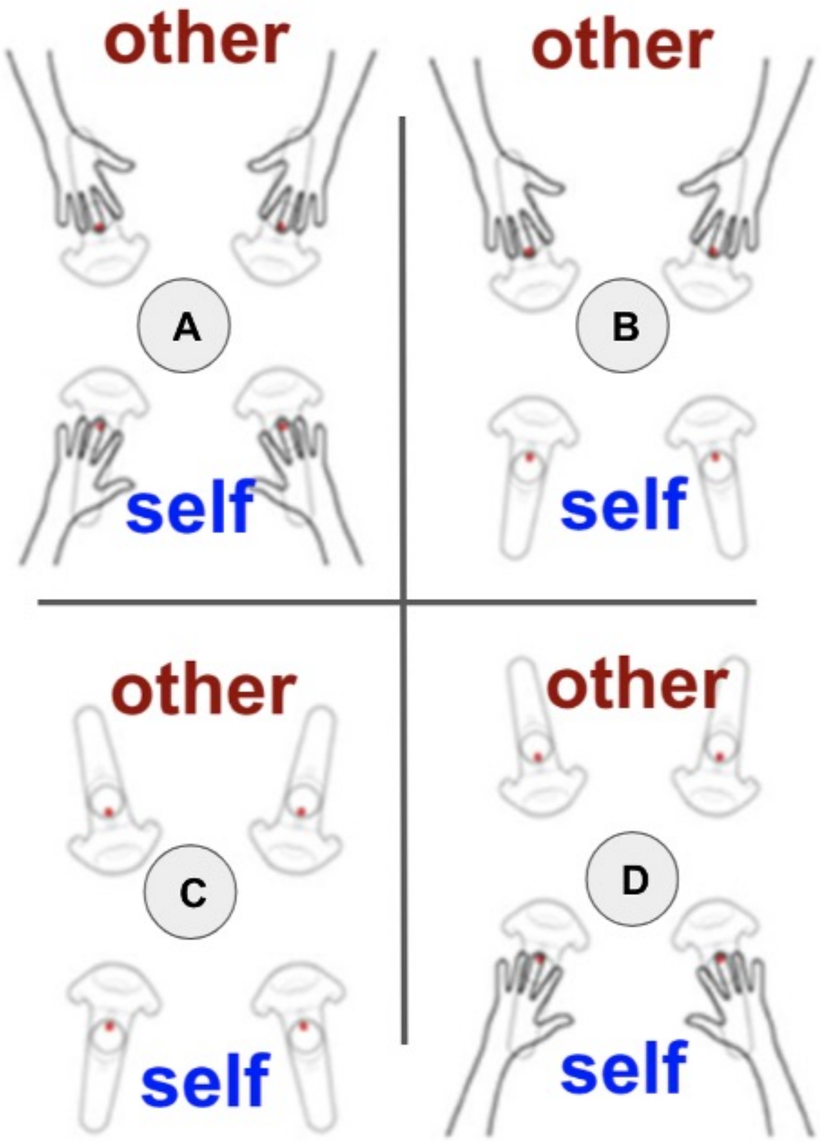


Study 1: Confederate

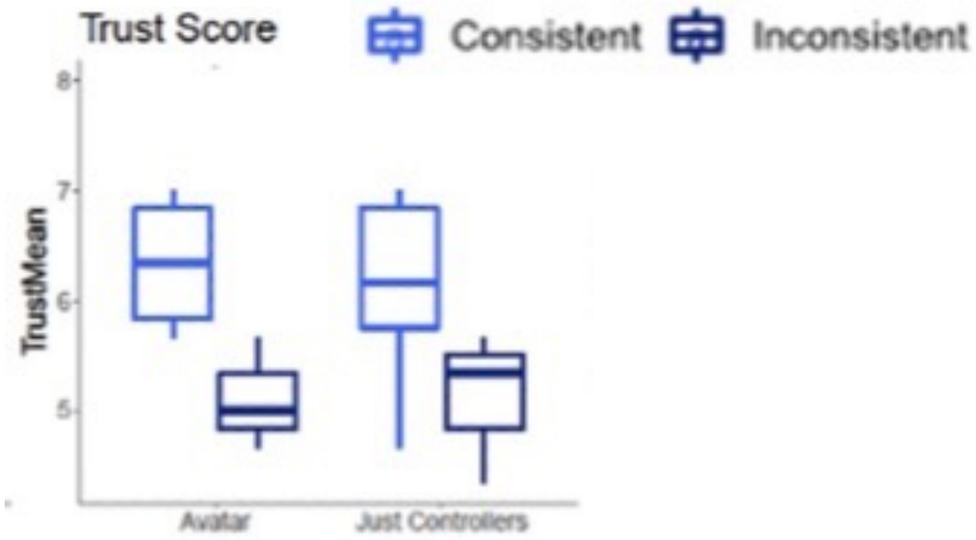


When confederate **did not have a body** (C&D), participants **trusted them more**.

Collingwoode-Williams et al. 2021, Frontiers in VR



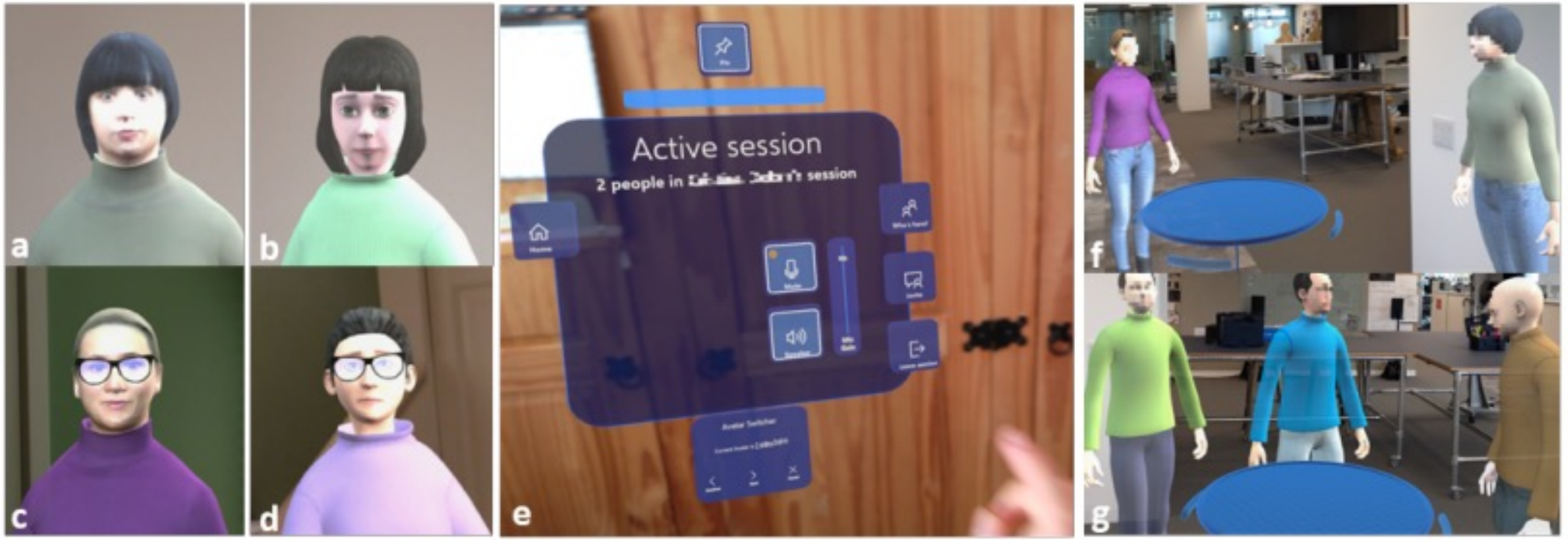
Study 2: Paired participants



Consistent conditions (A&C) are **better for trust** (questionnaires)

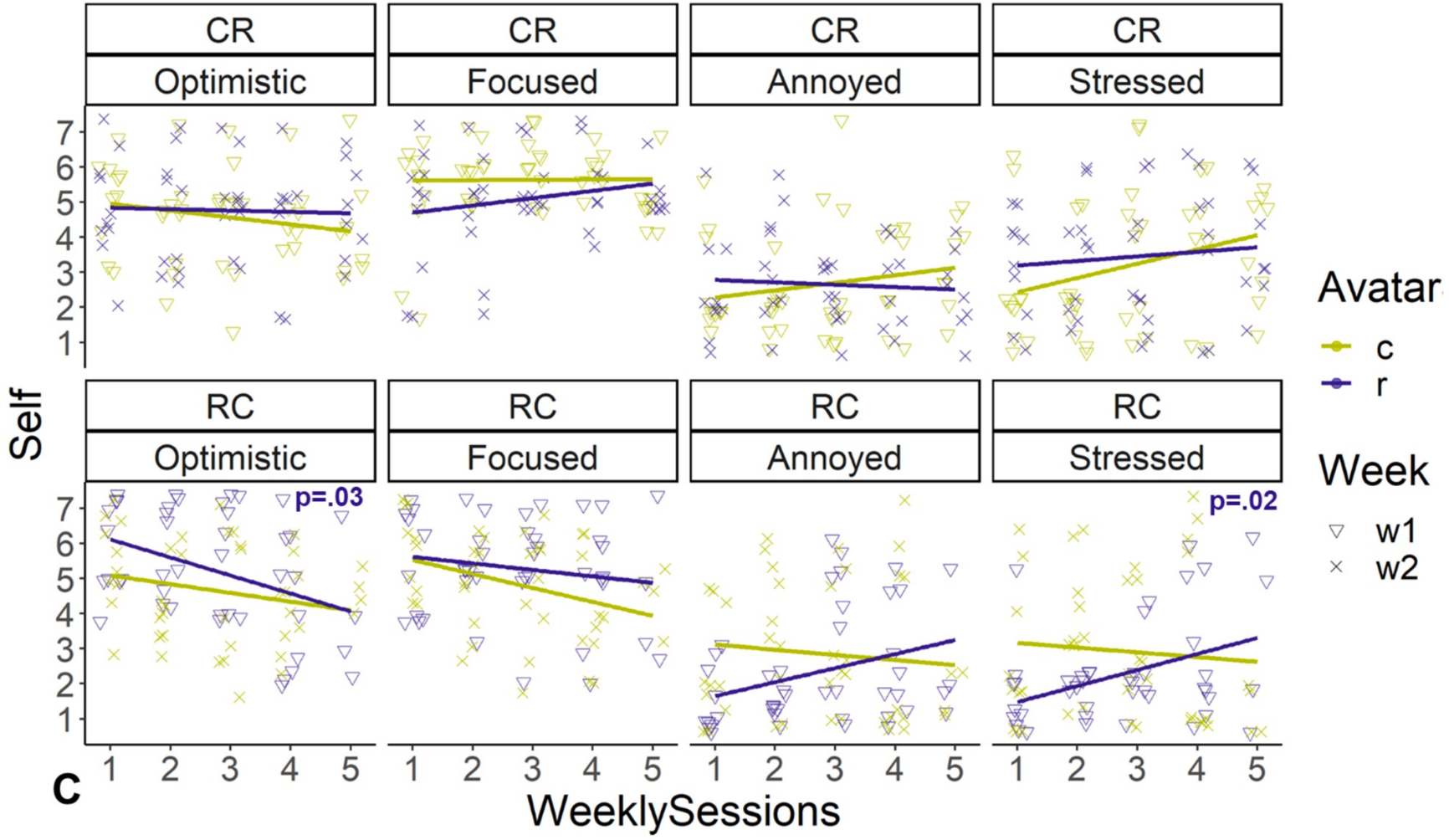
Collingwoode-Williams et al. 2021, Frontiers in VR

Longitudinal Communicative Effects of **Realistic** and **Cartoon** Avatars in **Mixed Reality Real Work Meetings**



Dobre et al. 2022, CHI LBW

Self rating emotion felt over the 5 days



Dobre et al. 2023 (under review)

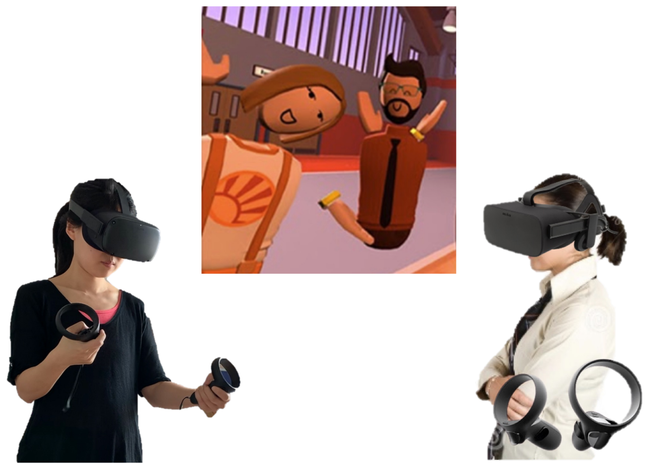
Psychological impact could be very **sensitive** to small changes in **technical setup of social VR**

Ultimate goal is to **represent human social signals in a complete way.**

Consistency matters.

Virtual Social Interaction

Avatar 👩🏻‍💻
driven by another person



Agent 🤖
driven by computer algorithms

Social VR

Virtually together, physically apart

Human-agent interaction

Non-player characters (NPCs) in gaming

Pan & Hamilton 2018

Pan & Slater 2007

Virtual Social Interaction

Avatar 👩🏻‍🚀
driven by another person

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Virtually together, physically apart

Hybrid (wizard-of-oz)

Human-in-the-loop

Human-agent interaction

Non-player characters (NPCs) in gaming

Pan & Hamilton 2018

Pan et al PLOS ONE 2016

Child Abuse Cues

Prof Caroline Fertleman
Consultant Paediatrician


Pan et al. 2018
Doctor talks through the two options

Measurements

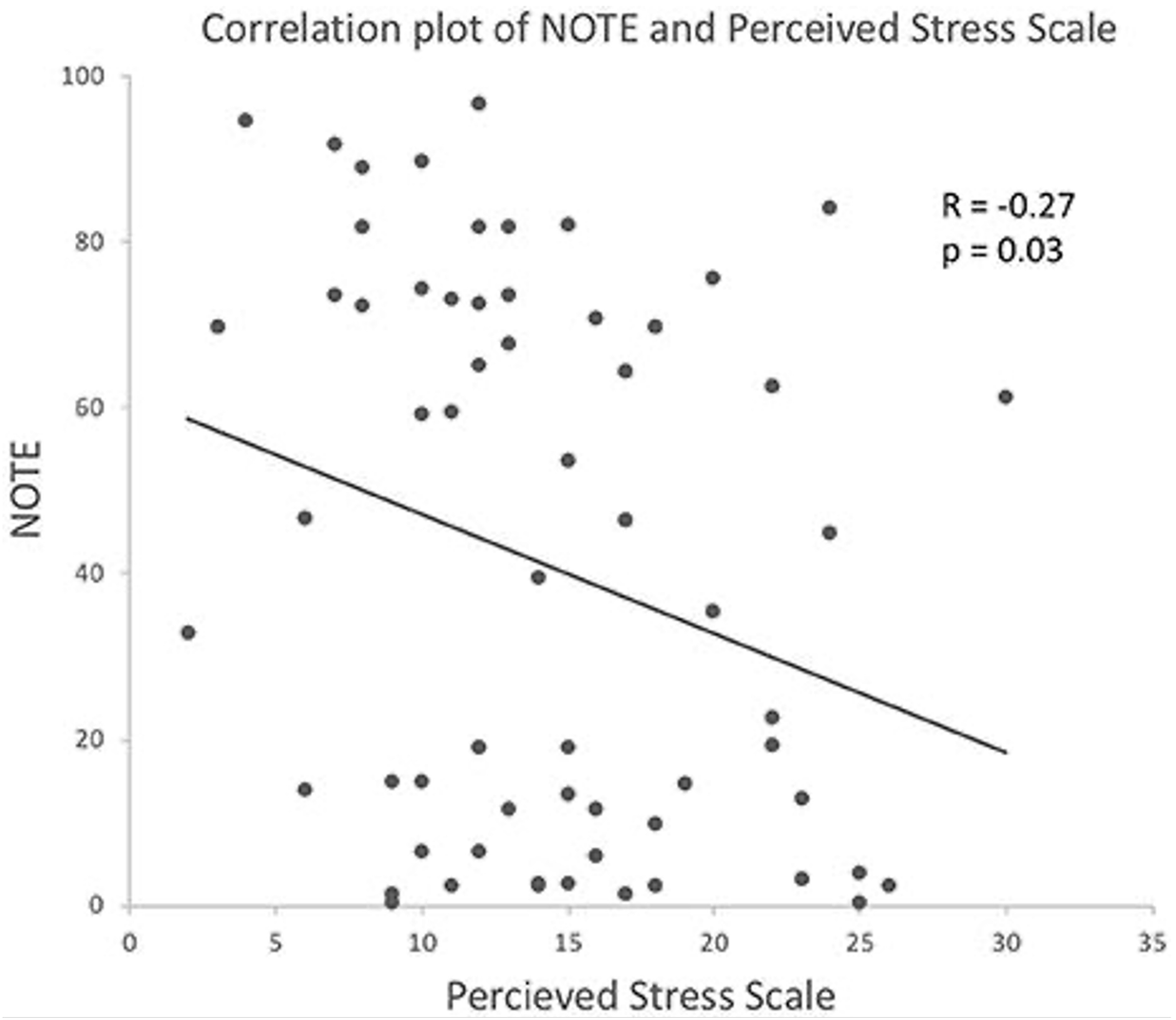
- Dependent variable [**NOTE**] - medical notes left immediately after the consultation. 10 raters rated each note with a 0-100 score for "*awareness of child-safeguarding issues and the development of some strategy to address those concerns*".

- Independent variables:

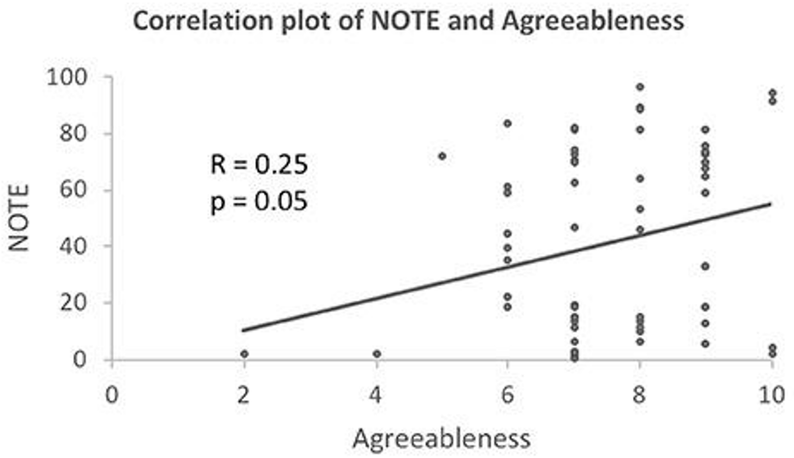
  - stress

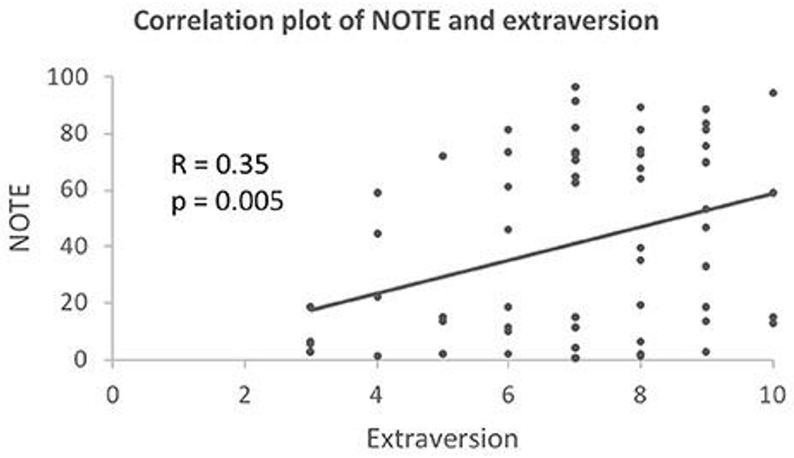
  - the big five personality

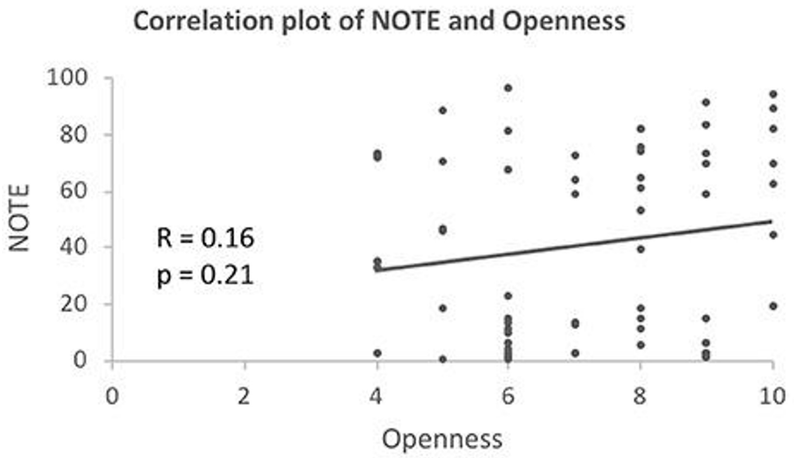
Perceived Stress Scale

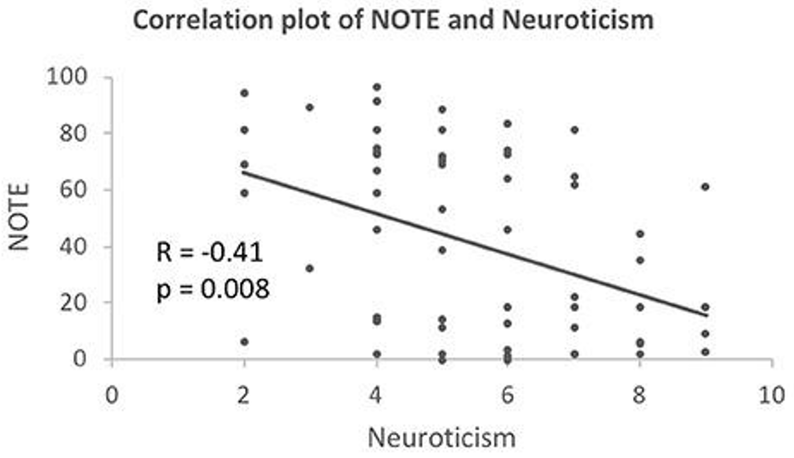


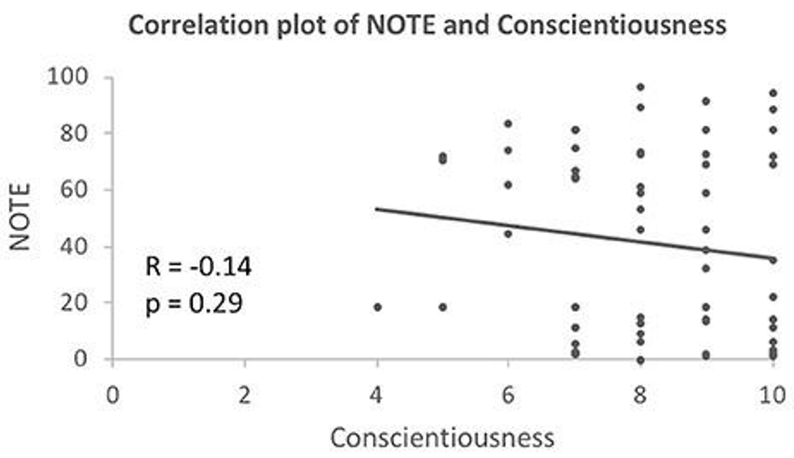
The big five


Correlation plot of NOTE and Agreeableness
R = 0.25
p = 0.05
NOTE
Agreeableness

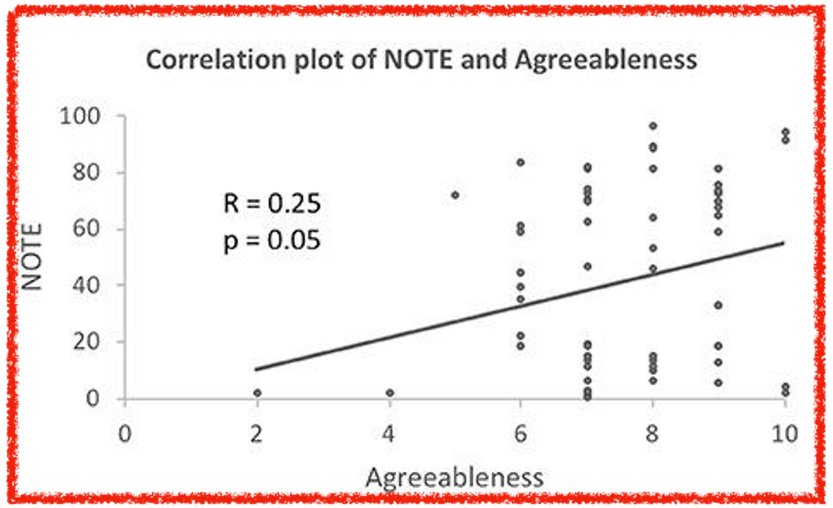

Correlation plot of NOTE and extraversion
R = 0.35
p = 0.005
NOTE
Extraversion

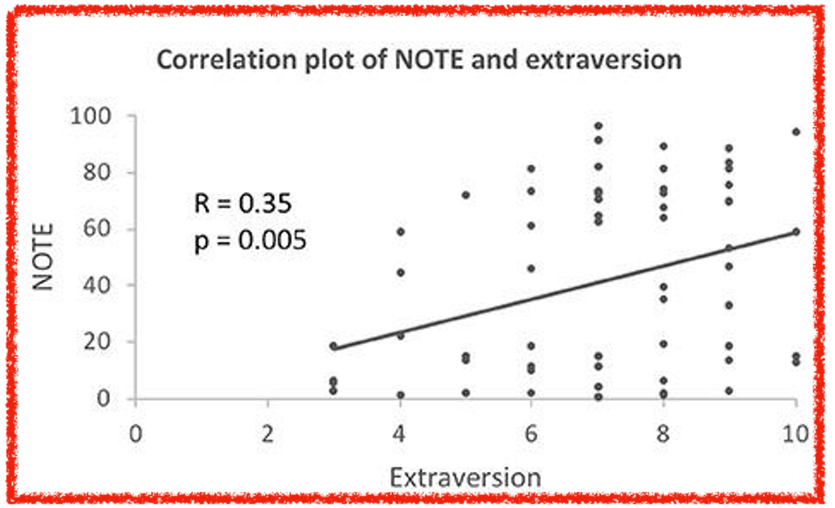

Correlation plot of NOTE and Openness
R = 0.16
p = 0.21
NOTE
Openness


Correlation plot of NOTE and Neuroticism
R = -0.41
p = 0.008
NOTE
Neuroticism


Correlation plot of NOTE and Conscientiousness
R = -0.14
p = 0.29
NOTE
Conscientiousness

The big five


Correlation plot of NOTE and Agreeableness
R = 0.25
p = 0.05
NOTE
Agreeableness
0
20
40
60
80
100
0
2
4
6
8
10


Correlation plot of NOTE and extraversion
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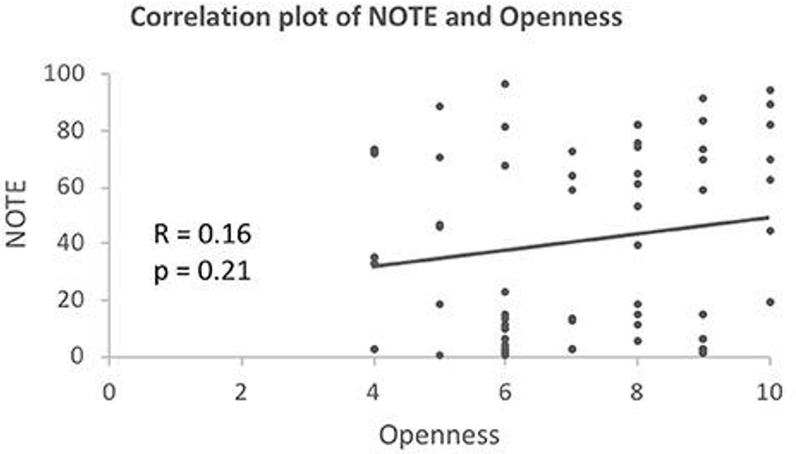
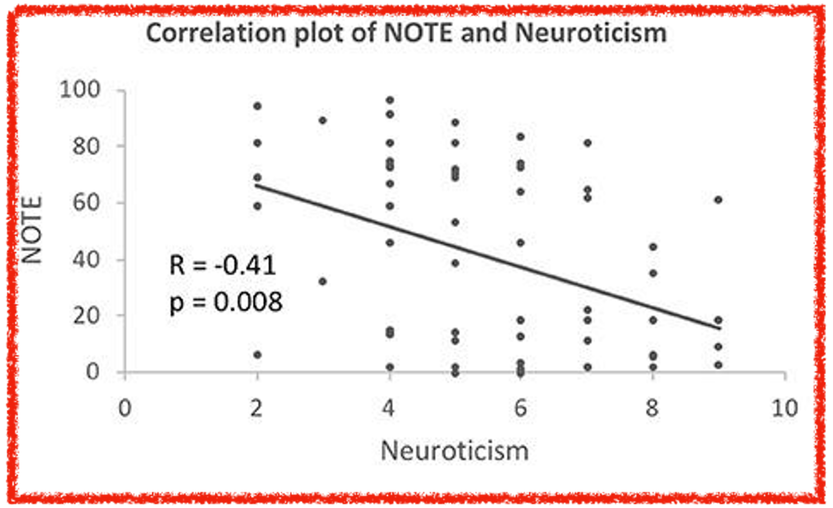
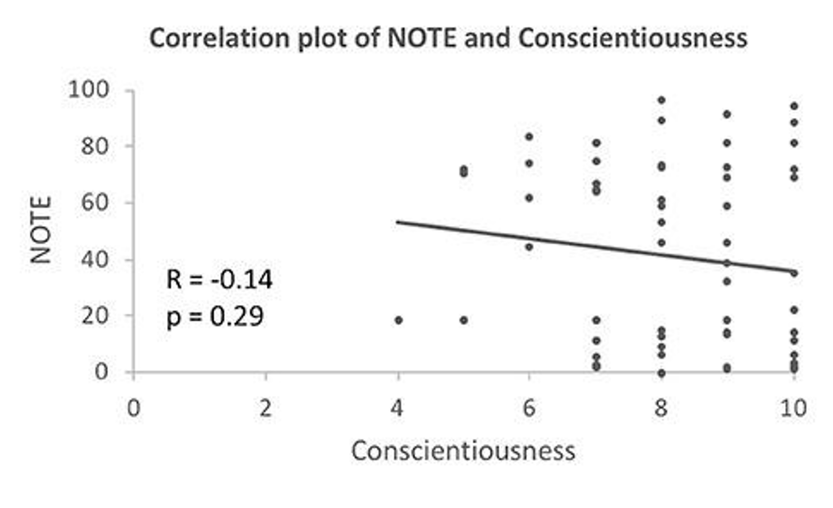
NOTE
Extraversion
0
20
40
60
80
100
0
2
4
6
8
10


Correlation plot of NOTE and Openness
R = 0.16
p = 0.21
NOTE
Openness
0
20
40
60
80
100
0
2
4
6
8
10


Correlation plot of NOTE and Neuroticism
R = -0.41
p = 0.008
NOTE
Neuroticism
0
20
40
60
80
100
0
2
4
6
8
10


Correlation plot of NOTE and Conscientiousness
R = -0.14
p = 0.29
NOTE
Conscientiousness
0
20
40
60
80
100
0
2
4
6
8
10

What is VR?

- **Place illusion** - the illusion of being there - immersion (supported by VR hardware)
- **Plausibility illusion** - the illusion of *events* in VR are real, and are related to you personally (supported by software)
- **Embodiment illusion** - the illusion of owning a body

Perceputal illusion

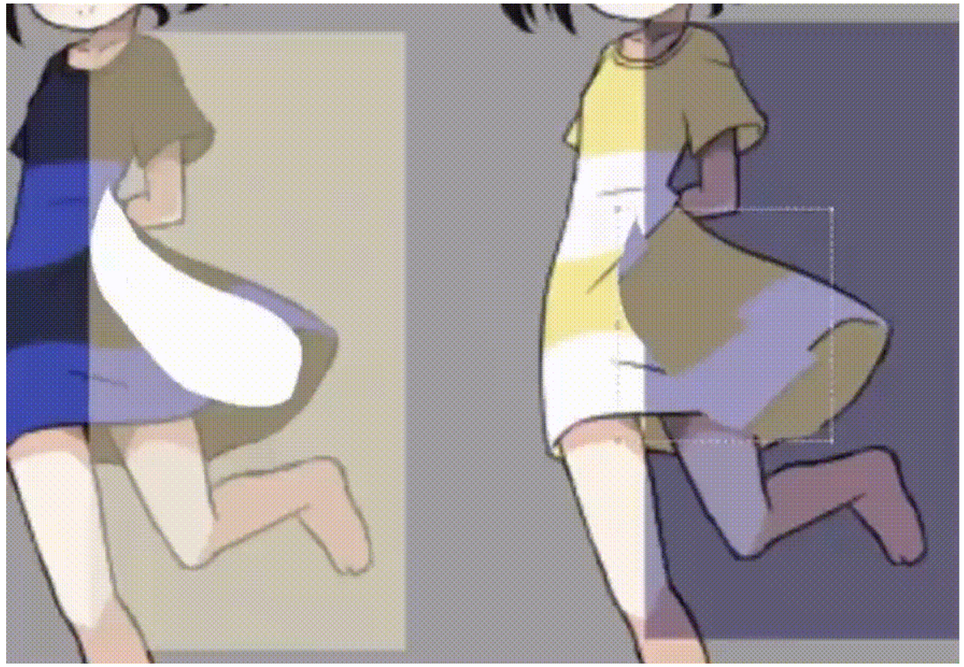
Cognitive illusion

Slater, 2009

Place illusion (PI) - the illusion of being there

Plausibility illusion (PSi) - the illusion of events in VR are real, and are related to you personally

Perceptual Illusion



Cognitive Illusion

Virtual Social Interaction

Avatar 👩🏻‍🚀
driven by another person

Agent 🤖
driven by computer algorithms

Social VR

Virtually together, physically apart

Hybrid (wizard-of-oz)

Human-in-the-loop

Human-agent interaction

Non-player characters (NPCs) in gaming

Pan & Hamilton 2018

Towards more child safety-oriented decisions through VR

Haoyang Du
Goldsmiths, University of London

Songkai Jia
Goldsmiths, University of London

Joel Gautschi
Zurich University of Applied Sciences

Julia Quehenberger
Zurich University of Applied Sciences

David Lätsch
Zurich University of Applied Sciences

Xueni Pan
Goldsmiths, University of London

SEE VR Lab

Social, Empathic, and Embodied VR Lab at Goldsmiths, University of London

Prof Sylvia Xueni Pan

Sylvia is a Professor of VR. She is the co-head of the SEE VR Lab.

Prof Marco Gillies

Marco is a Professor of Computing. He is the co-head of the SEE VR Lab.

Tara Collingwoode-Williams

Tara is a Lecturer in VR, and a final year PhD student in VR Embodiment.

Nima Jamalian

Nima is a Lecturer in VR, and a final year PhD student in VR hand tracking.

Clarice Hilton

Clarice is a creative technologist and researcher in immersive artwork.

Fang Ma

Fang is a RA in the IIIE project and a PhD student focusing on virtual humans.

Georgiana Cristina Dobre

Cristina is a PhD student in AI-driven Character for immersive experiences such as gaming and training.

Carlos Gonzalez Diaz

Carlos is a PhD student in interactive machine learning and movement interaction design VR.

Janet Gibbs

Janet is a PhD student in sensori-motor contingency and presence.

Nicky Donald

Nicky is a PhD student in virtual performance and 3D projection.

Claire Yuke Pi

Claire is a RA in the Child Embodiment project and a PhD student in Embodied interaction

Chaojing Li

Chaojing is a PhD student on VR for interactive narrative experiences.

@panxueni @marcogillies

Goldsmiths
UNIVERSITY OF LONDON

SEE VR Lab

Social, Empathic, and Embodied VR Lab at Goldsmiths, University of London

SEE VR Lab

Social, Empathic, and Embodied VR Lab at Goldsmiths, University of London

MA/MSc in V&AR 2021

SeeVR Lab Xmas 2019

SeeVR Lab Lunch 2022