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# VIRTUELLE REALITÄT (VR) UND CHRONISCHER SCHMERZ. GRUNDLAGEN UND THERAPEUTISCHE OPTIONEN

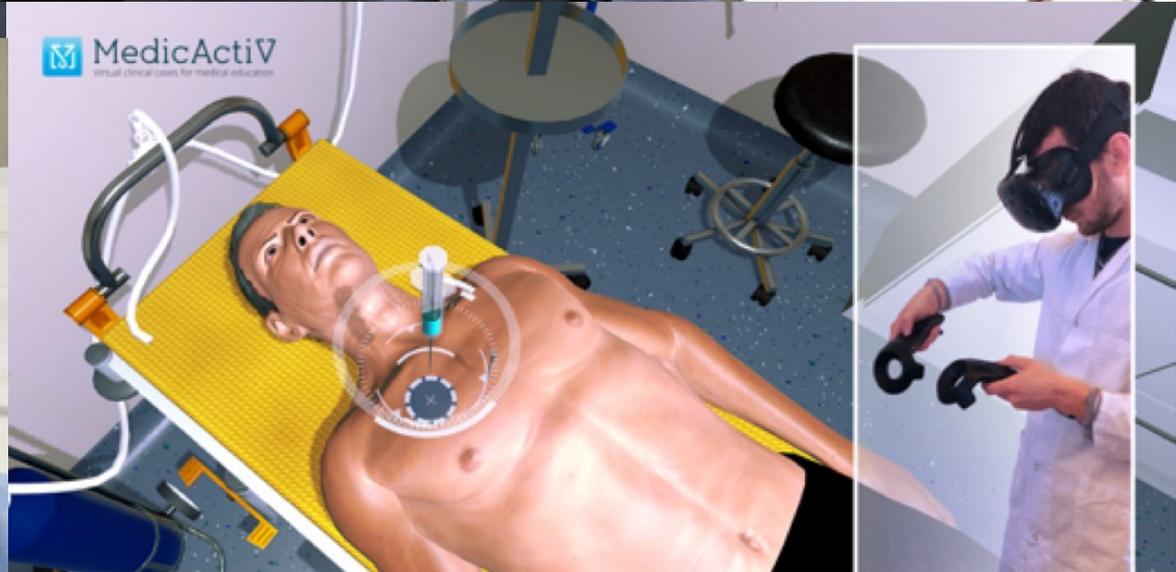


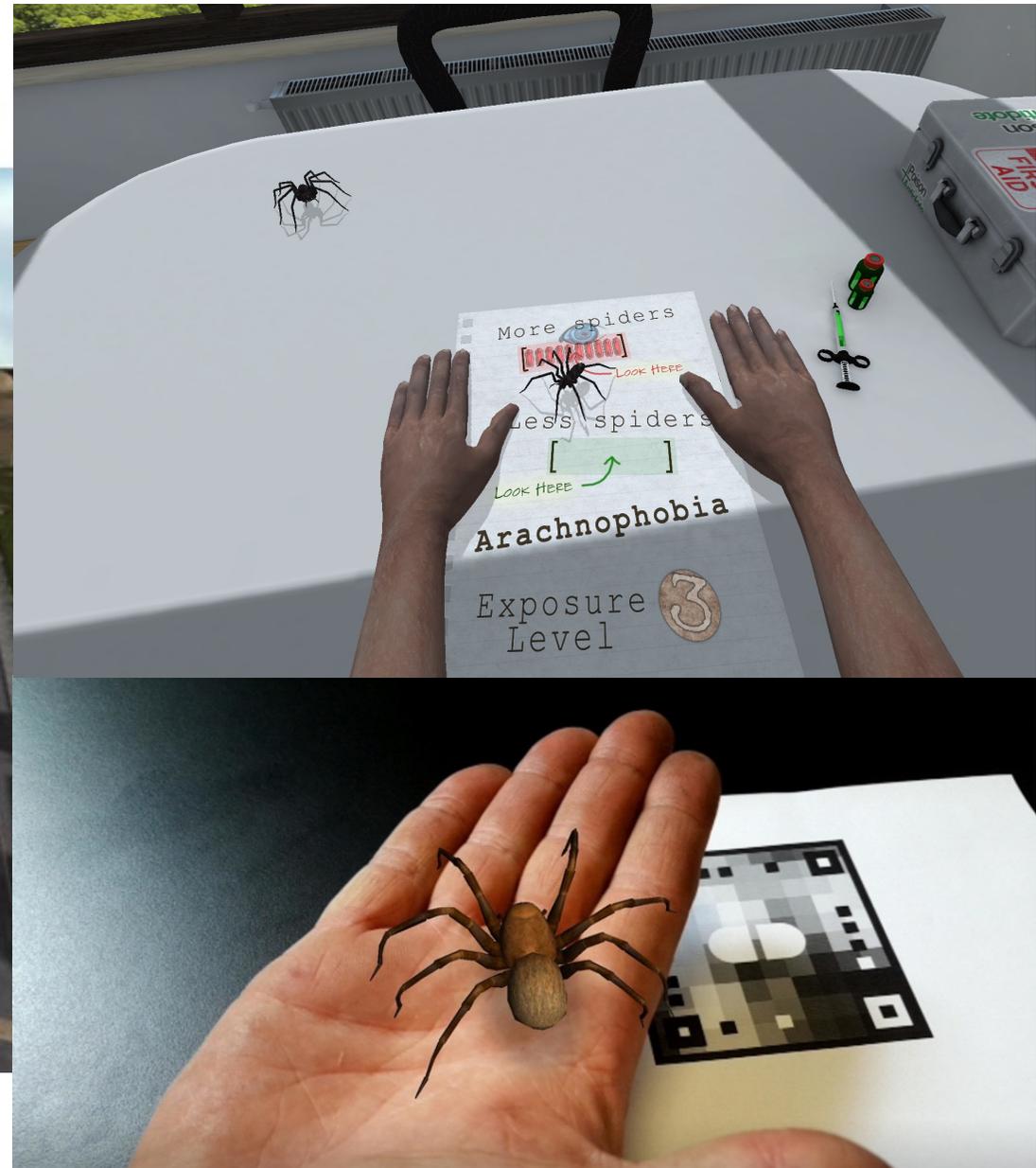
Jasmine Ho  
18.11.2023

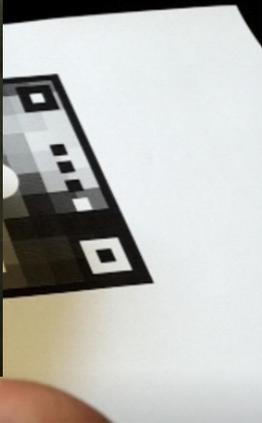
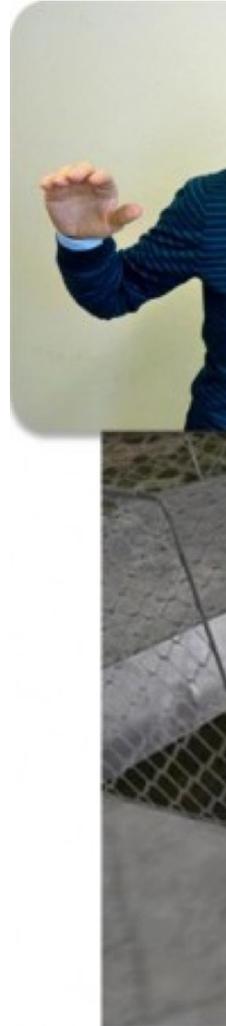
# VR im Gesundheitswesen

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Hitlab/HarborView SnowWorld ([www.imprintit.com](http://www.imprintit.com))



**WAS MACHT VR SO WIRKUNGSVOLL?**



A person in a red jacket and dark pants stands on a rocky peak, looking out over a vast mountain range. The sky is filled with soft, white clouds, and the sun is low on the horizon, creating a hazy, golden light. The overall scene is serene and majestic.

# PRÄSENZ (PRESENCE)

ANWESENHEIT  
[BEWUSST WAHRGENOMMENE] GEGENWÄRTIGKEIT

A person wearing a red jacket and a backpack stands on a rocky mountain peak, looking out over a vast valley filled with a sea of clouds. The sky is filled with soft, white clouds, and the overall scene is bathed in a warm, golden light, suggesting a sunrise or sunset. The person is positioned on the left side of the frame, looking towards the right.

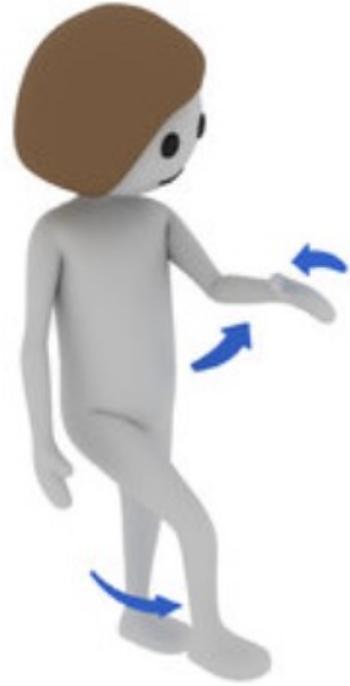
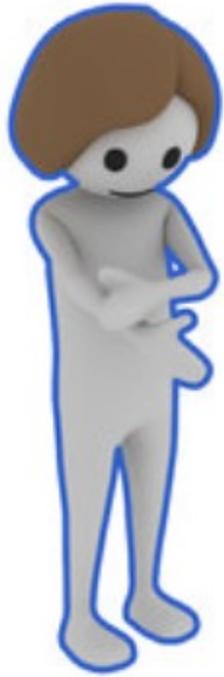
# VERKÖRPERUNG (EMBODIMENT)

BODY OWNERSHIP  
AGENCY

## The Rubber Hand Illusion (Botvinick & Cohen, 1998)

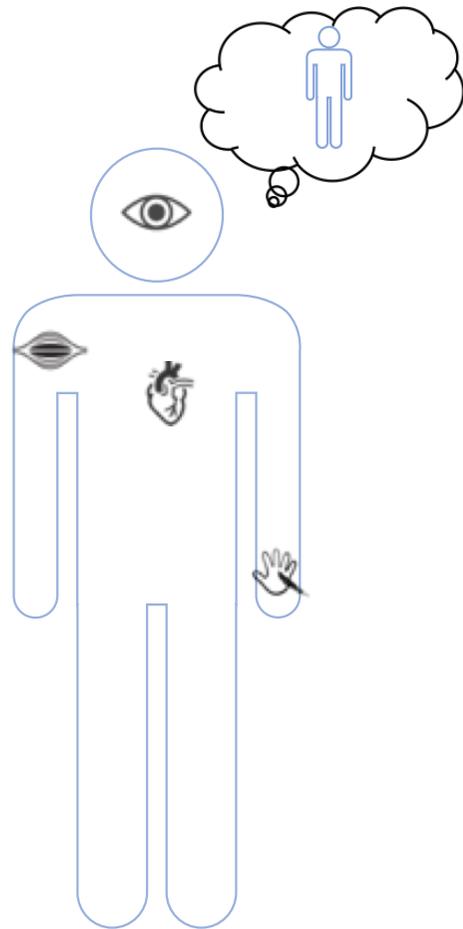
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# Aktives, probabilistisches Körpererleben

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Körperbild/Identität  
(top down)



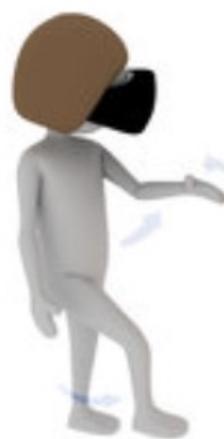
Körperliches Selbsterleben  
(plastisch)



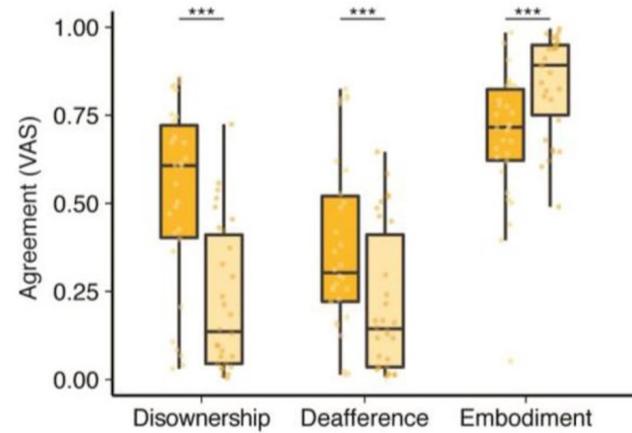
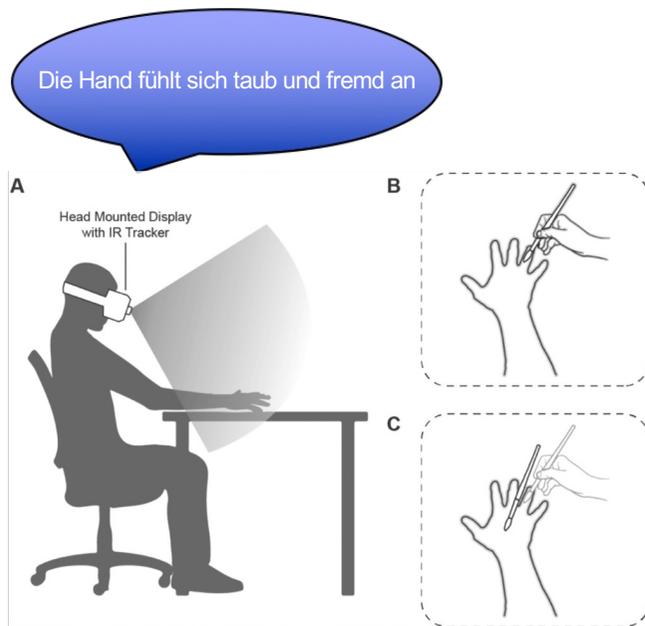
(bottom up)  
Multisensorische Inputs



Manipulation von  
multisensorischer Stimulationen



# “Disownership” Entfremdungsillusionen



Kannape et al. 2019, *Neuropsychologia*

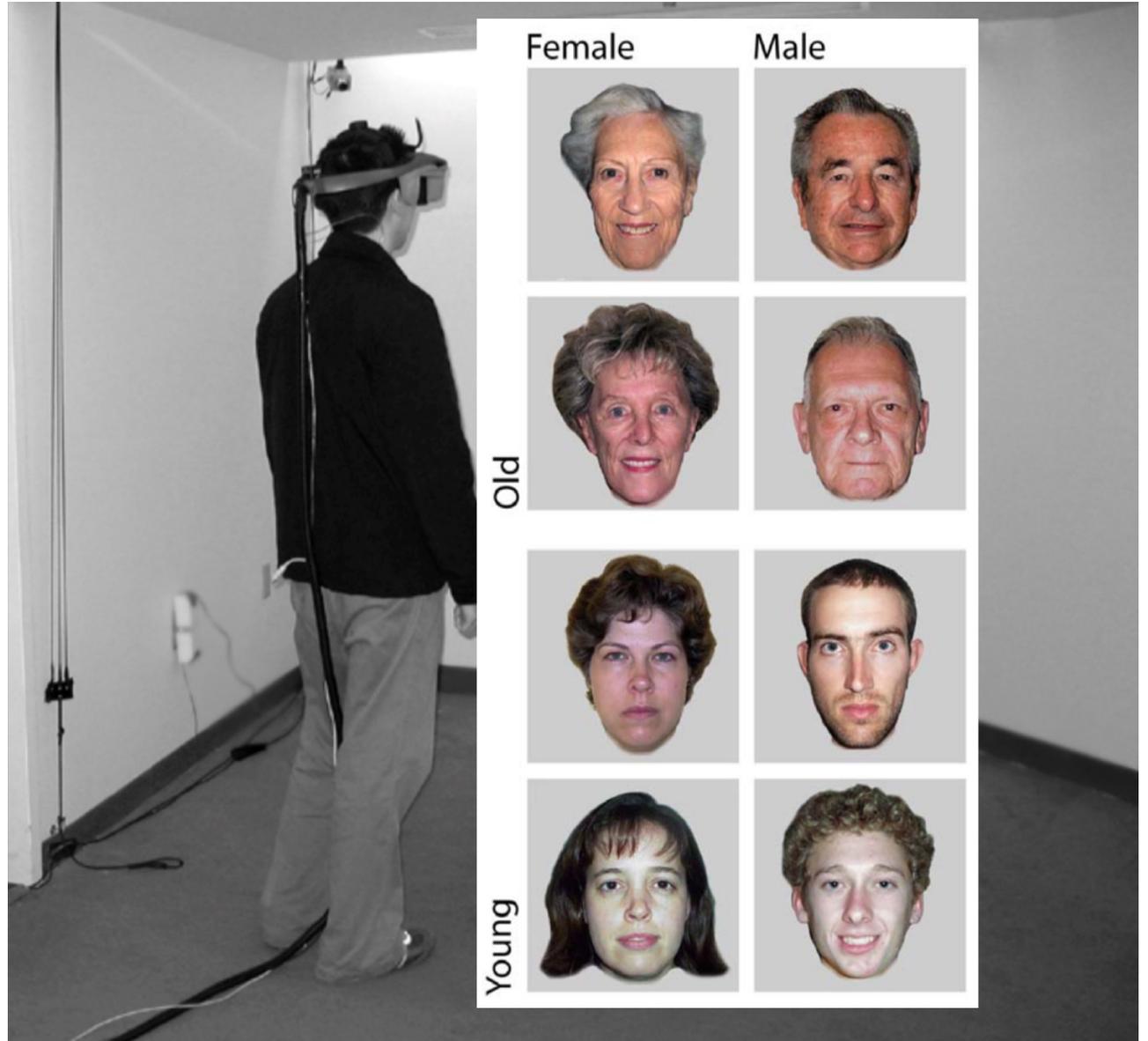
Roel et al., 2019, *BioRxiv*

## Virtuelle Ganzkörperillusion





Peck, Seinfeld, Aglioti & Slater (2013) *Consciousness and Cognition*



Yee & Bailenson (2006) *Proceedings of Presence*

# Virtueller Geschlechtertausch

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Bolt, Ho, Soutschek, Roel Lesur, Tobler & Lenggenhager, 2022 – *Scientific Reports*

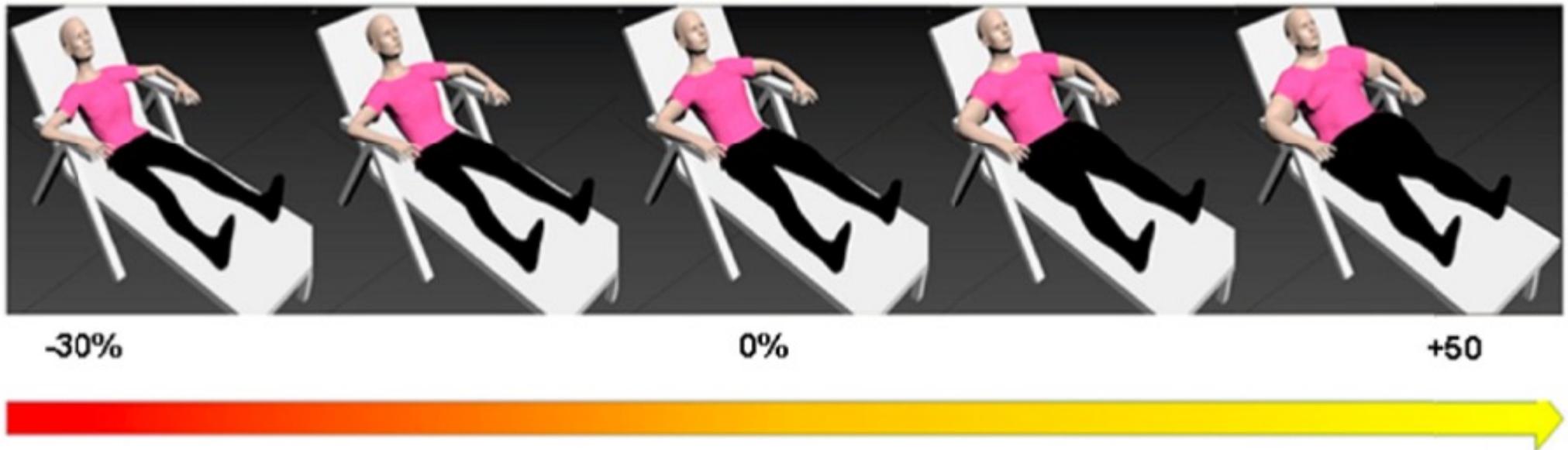
# VR zur Bekämpfung von Anorexie

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## VR zur Bekämpfung von Anorexie

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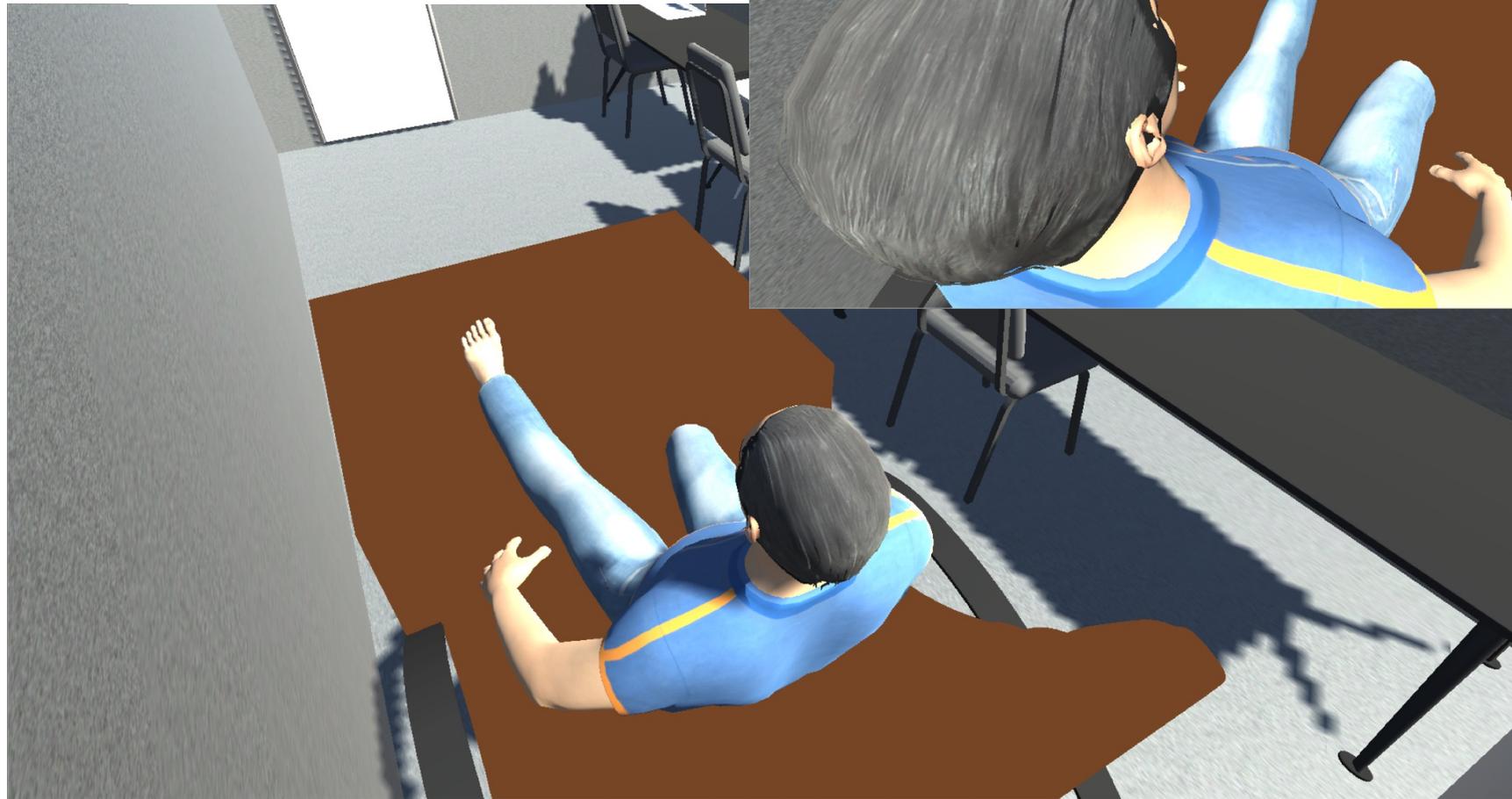
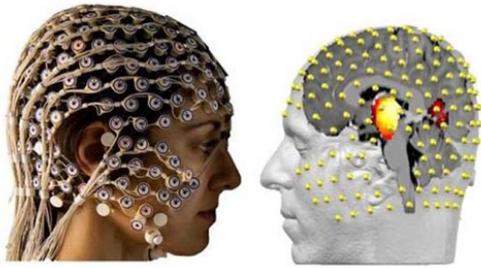


Provenzano et al. (2019), *Journal of Clinical Medicine*

## Body integrity dysphoria

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Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**ScienceDirect**

Journal homepage: [www.elsevier.com/locate/cortex](http://www.elsevier.com/locate/cortex)



## Research report

# Not my body, not my pain? Pain perception and placebo analgesia in individuals with body integrity dysphoria



Jasmine T. Ho <sup>a,b,\*</sup>, Peter Kruppenacher <sup>b,c</sup> and Bigna Lenggenhager <sup>a,d</sup>

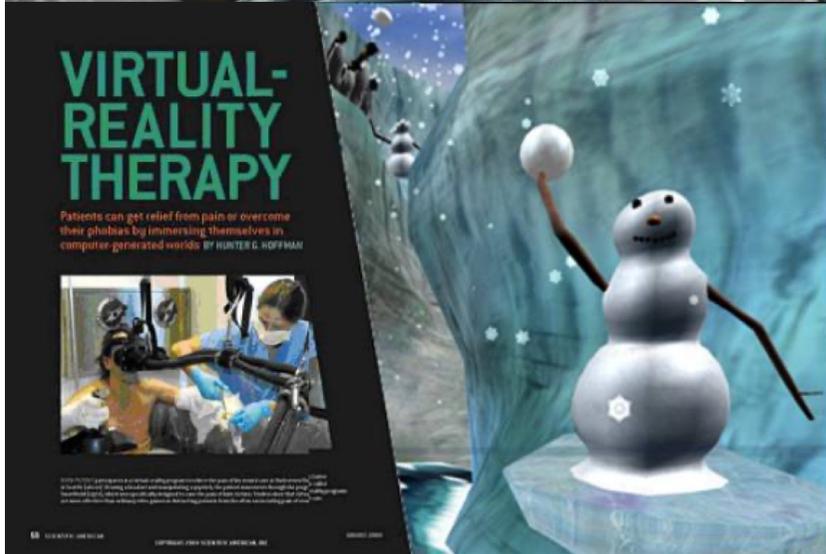
<sup>a</sup> University of Zurich, Department of Psychology, Zurich, Switzerland

<sup>b</sup> Brainability, LLC, Zurich, Switzerland

<sup>c</sup> Experimental and Clinical Pharmacopsychology, Department of Psychiatry, Psychotherapy, Psychotherapy and Psychosomatics, Zurich, Switzerland

<sup>d</sup> Department of Psychology, University of Konstanz, Konstanz, Germany

# VR gegen Schmerzen



# Schmerz und Placebos in Virtual Reality

Clinical Trial > [J Pain](#). 2022 Apr;23(4):625-640. doi: 10.1016/j.jpain.2021.10.009.

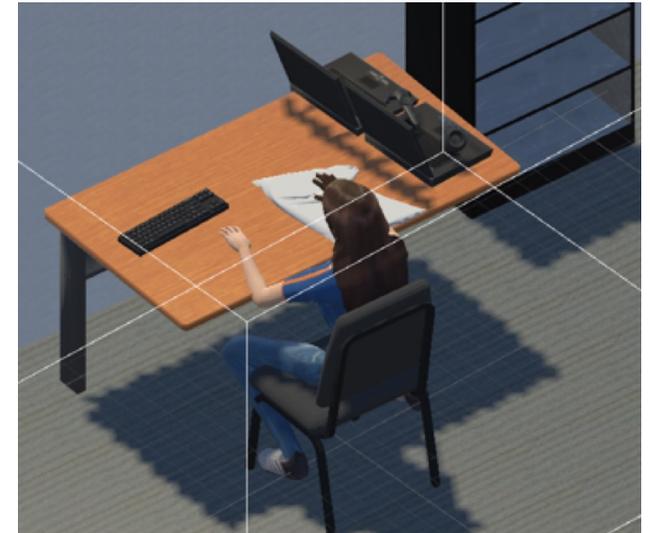
Epub 2021 Nov 12.

## Real Bodies Not Required? Placebo Analgesia and Pain Perception in Immersive Virtual and Augmented Reality

Jasmine Tian Ho <sup>1</sup>, Peter Krummenacher <sup>2</sup>, Marte Roel Lesur <sup>3</sup>, Gianluca Saetta <sup>3</sup>, Bigna Lenggenhager <sup>3</sup>

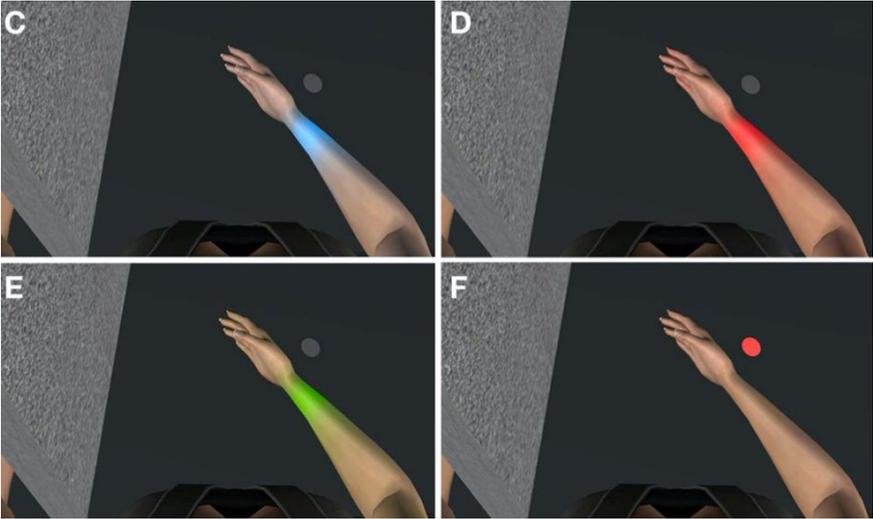
Affiliations + expand

PMID: 34780993 DOI: [10.1016/j.jpain.2021.10.009](#)

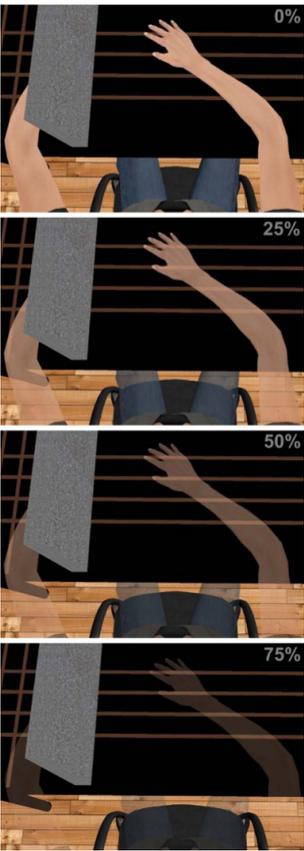


Ho, Krummenacher, Roel Lesur, Saetta & Lenggenhager (2022) - *The Journal of Pain*

# Körperillusionen – experimenteller Schmerz



Martini, Perez & Sanchez-Vives (2013), *Frontiers in Human Neuroscience*

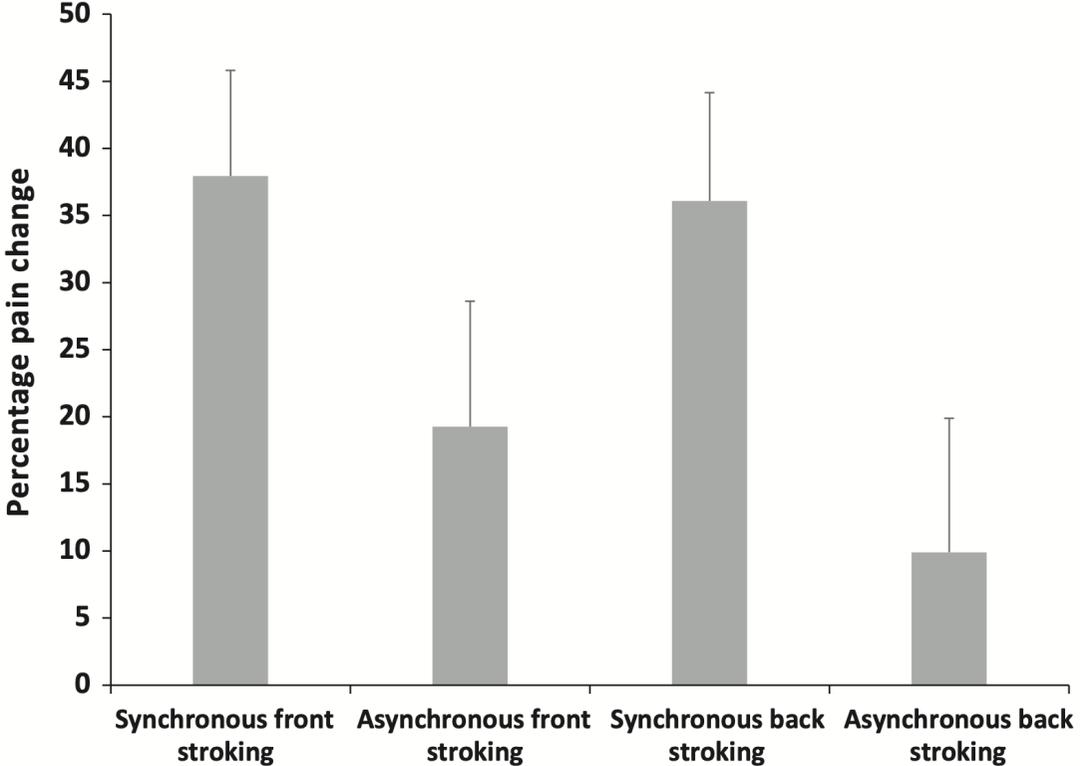
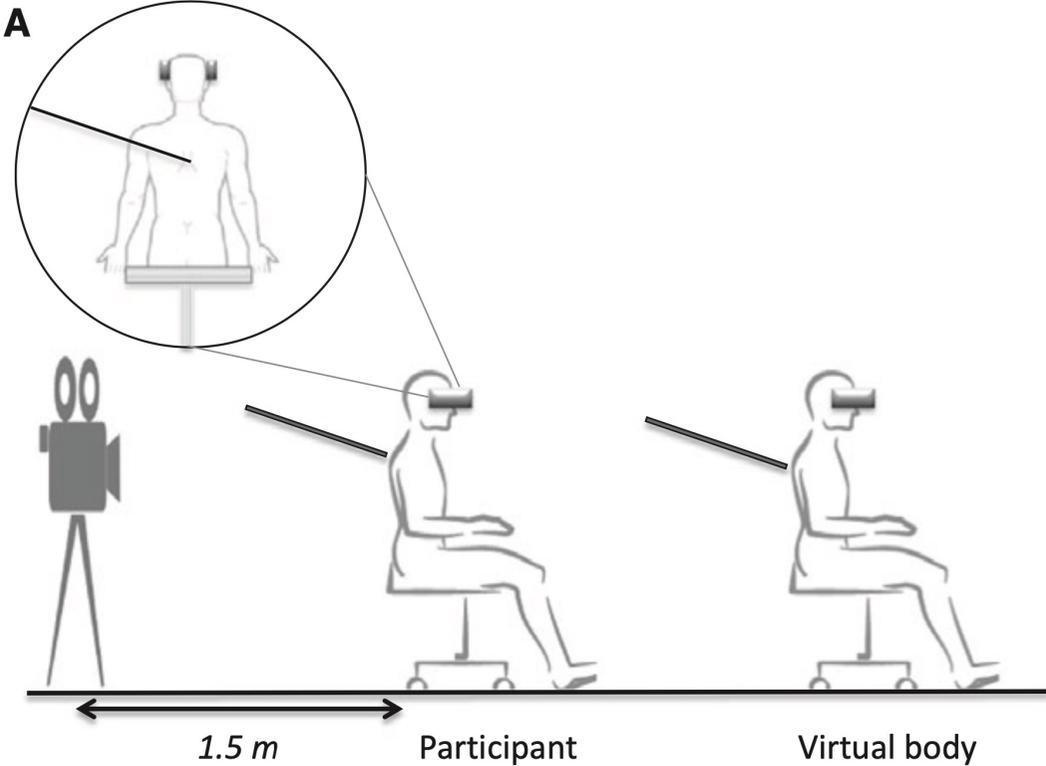


Martini, Kilteni, Maselli & Sanchez-Vives (2015), *Scientific Reports*



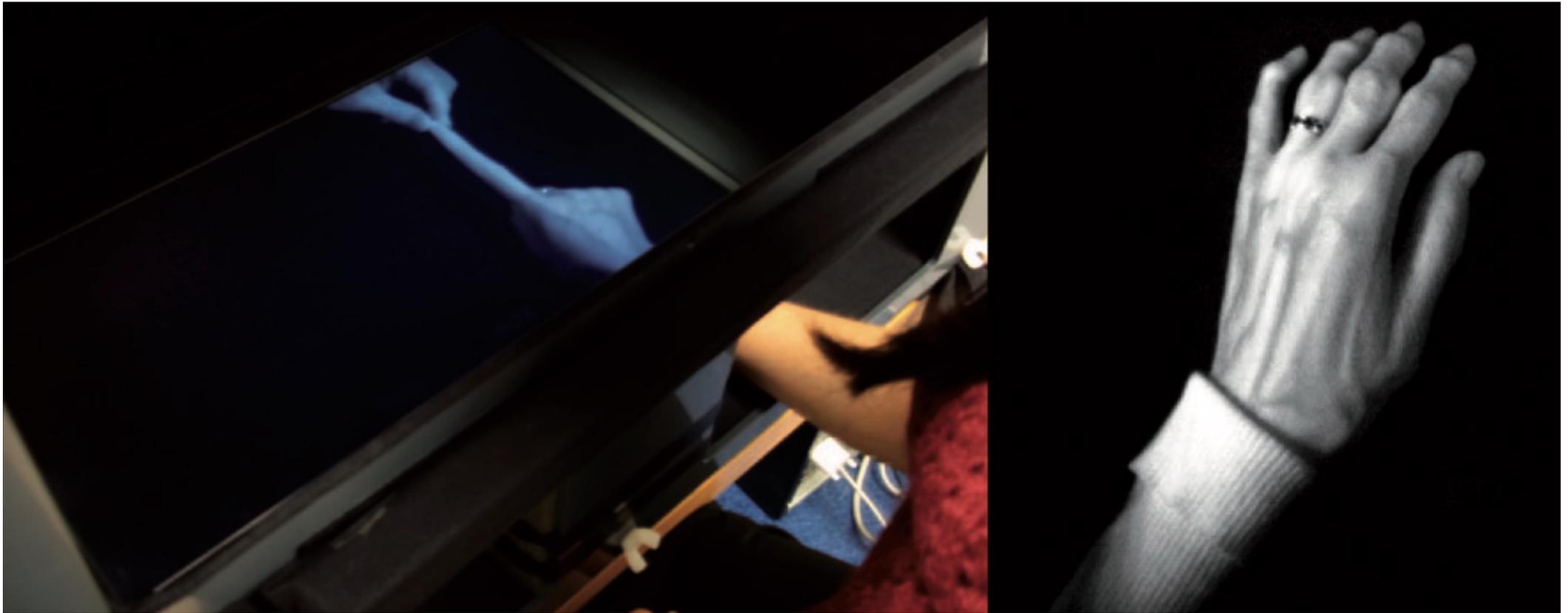
Ho, Lyn, Roel Lesur, Lenggenhager, *in prep*

# Out-of-body Illusion – chronische Schmerzen



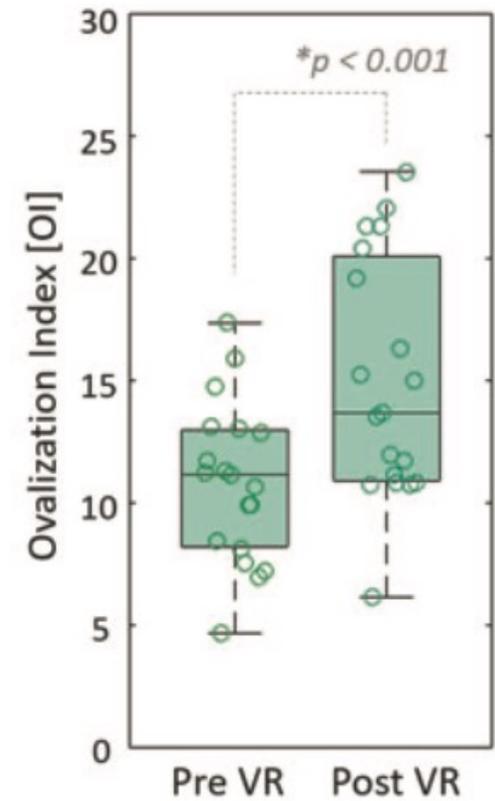
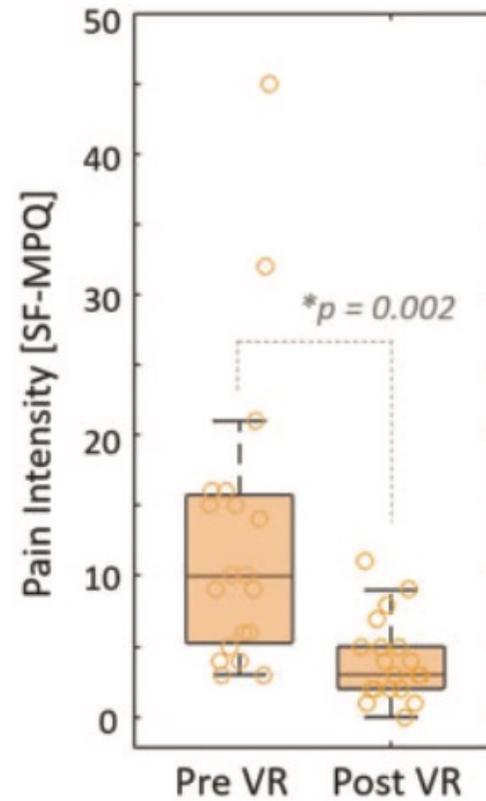
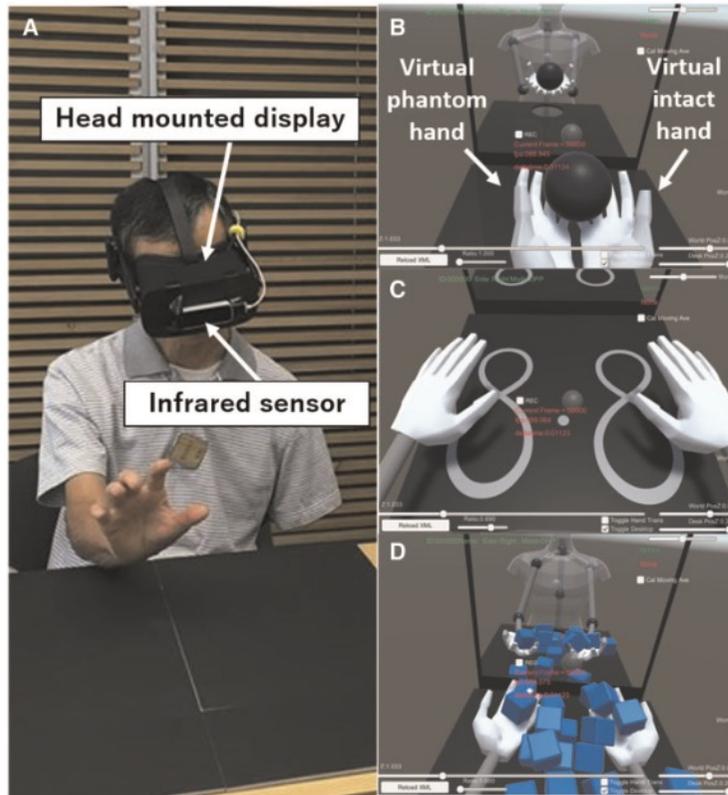
## Körperillusionen – osteoarthritis

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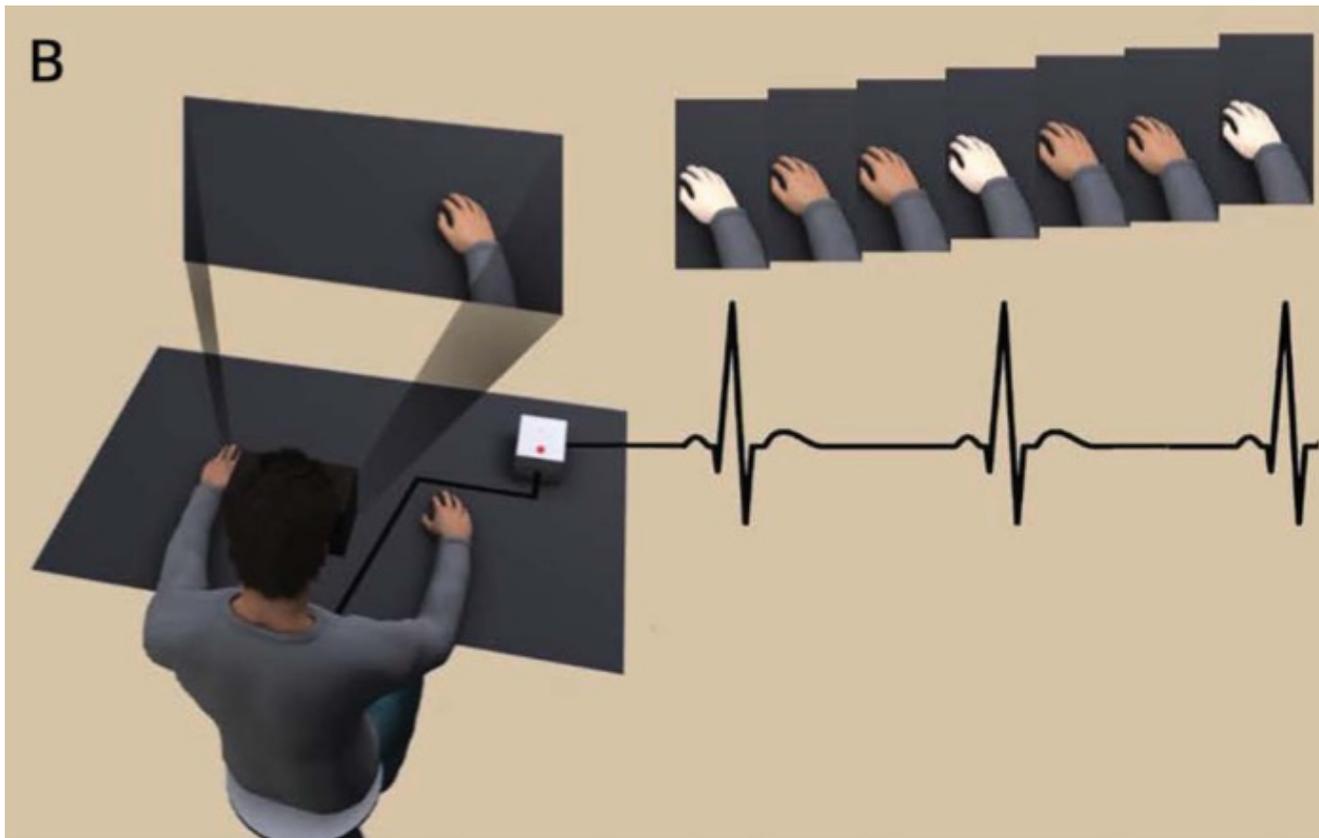
Preston & Newport (2011), *Rheumatology*

# Körperillusionen – Phantomschmerzen

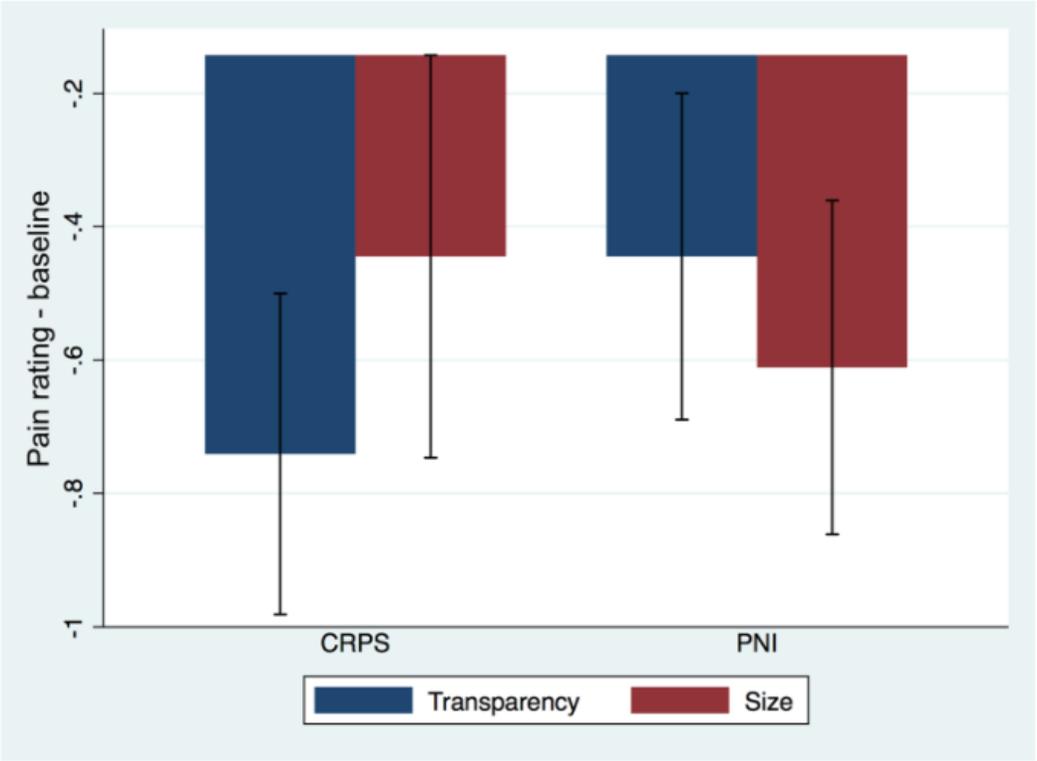
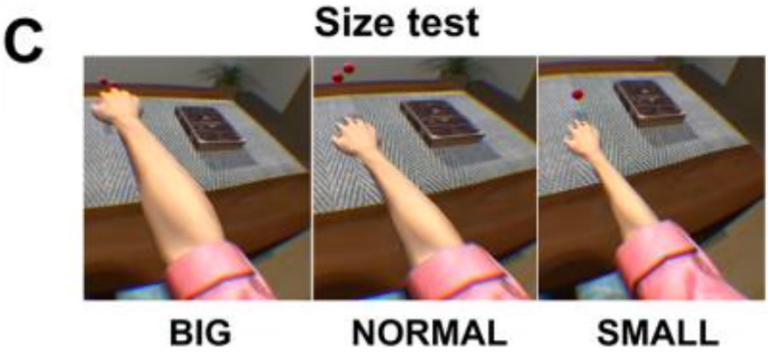
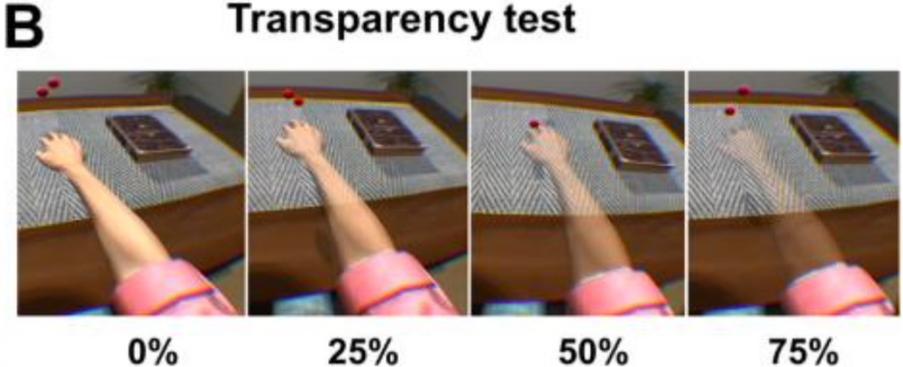


## Flashing - CRPS

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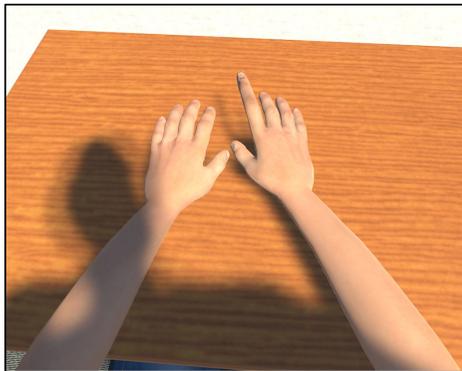


# CRPS und periphere Nervenverletzung



# Virtual bodily illusions for chronic pain

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**COMPLEX REGIONAL  
PAIN SYNDROME**  
Transparency



**HEAT PAIN**  
Colors



**OSTEOARTHRITIS**  
Stretching



**PHANTOM LIMB PAIN**  
Shrinking





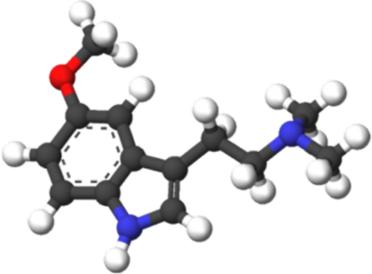
**SOMA REM**

[www.soma-rem.com](http://www.soma-rem.com)

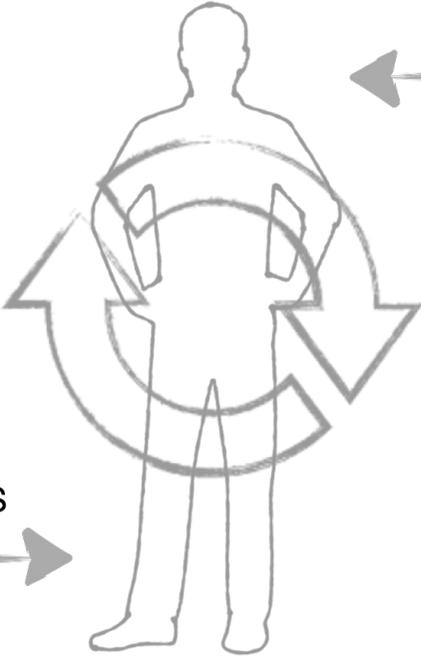
CHANGE THE REALITY OF CHRONIC PAIN



# Pharmakologisch veränderte VR Erfahrungen



RE002



# Pharmakologisch veränderte Wahrnehmung des Körpers

Neuroscience and Biobehavioral Reviews 108 (2020) 526–541



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Neuroscience and Biobehavioral Reviews

journal homepage: [www.elsevier.com/locate/neubiorev](https://www.elsevier.com/locate/neubiorev)



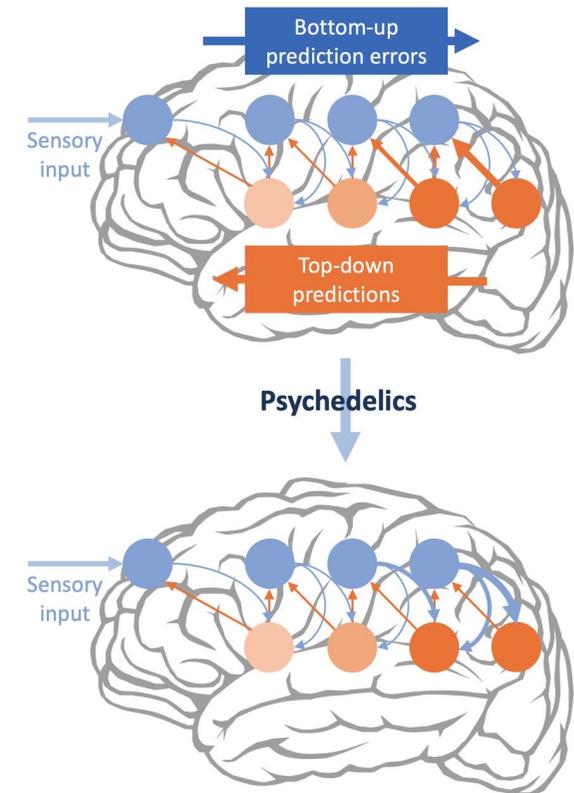
Review article

## Neuropharmacological modulation of the aberrant bodily self through psychedelics

Jasmine T. Ho<sup>a,\*</sup>, Katrin H. Preller<sup>b</sup>, Bigna Lenggenhager<sup>a</sup>

<sup>a</sup> University of Zurich, Department of Psychology, Binzmühlestrasse 14, Box 9, 8050, Zurich, Switzerland

<sup>b</sup> Department of Psychiatry, Psychotherapy and Psychosomatics, Pharmaco-Neuroimaging and Cognitive-Emotional Processing, Psychiatric Hospital, University of Zurich, Lenggstrasse 31, CH-8032, Zürich, Switzerland

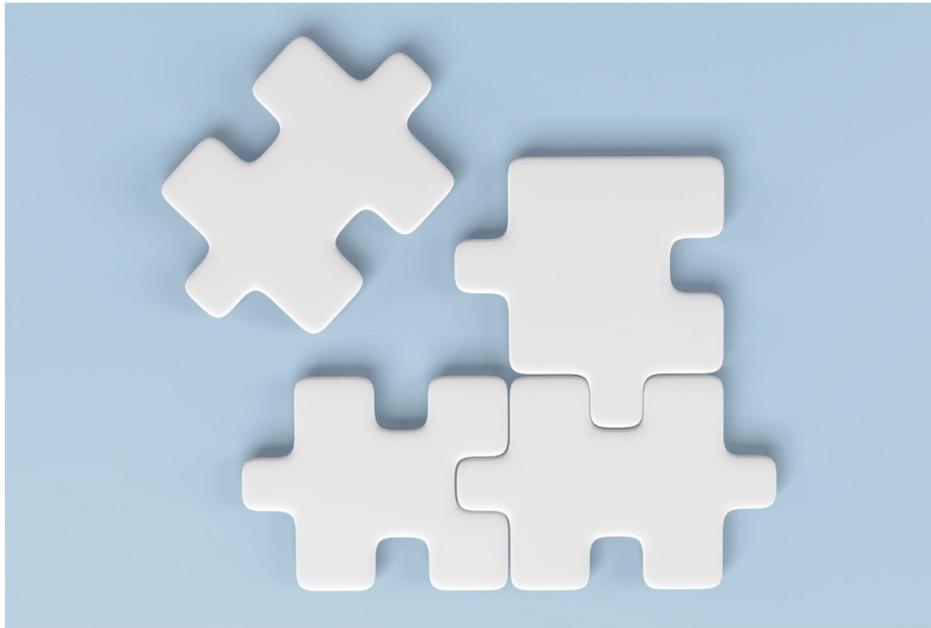


Carhart-Harris & Friston, 2019, *Pharmacological Reviews*

# SNF Sinergia – Team

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**Sinergia – interdisciplinary,  
collaborative and breakthrough**



Petra Schweinhardt, MD, PhD  
*Balgrist University Hospital*



Milan Scheidegger, MD, PhD  
*University of Zurich*



Bigna Lenggenhager, PhD  
*Psychiatric University Hospital Zurich*



Felix Scholkmann, PhD  
*University Hospital Zurich*

27 MARCH 2019 ANALYSIS

## Virtual pain relief: could VR start a rehab revolution?

By Chris Lo

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MARCH 20, 2019 6:34AM PT

## Doctors Look to Virtual Reality to Treat Chronic Pain

By SAM DESATOFF



AUGUST 14, 2019

## Virtual reality experiences may help treat severe pain

by Public Library of Science



VIRTUAL  
MEDICINE

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