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# The experience of time in altered states of consciousness

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Workshop at  
13th SYMPOSIUM OF BIAL FOUNDATION  
7.4.2022

# Agenda

## Modulations of the sense of self and time

1. A real waiting situation: alone in a waiting room
2. Judging time of a body-centered meditation **indoors** and in **nature**  
Method to avoid problems with control condition
3. Meditation in experienced meditators

Inexperienced meditators → Increase in mindfulness : time slowing down

Experienced meditators → Loss of sense of time and self

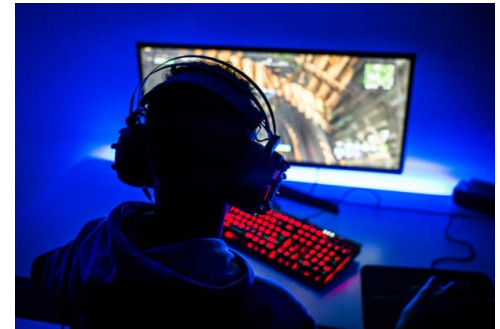
## Hypothesis:

Self (body) consciousness  $\updownarrow$  = Time consciousness  $\updownarrow$

- Intensified awareness of the self (body, feelings): intensified awareness of time
- Weakened awareness of the self (body, feelings): less awareness of time

## Flow:

Absorbed in activity => no feeling of self and time



## Boredom/ Waiting time:

Particularly intensive awareness of self and time



# Self & time: Altered states of consciousness

Intensified self-experience

=>

„Ego“ dissolution

Slowing down of time

Dissolution of time & space

**Meditation**

**Hypnosis**

Floating Tank

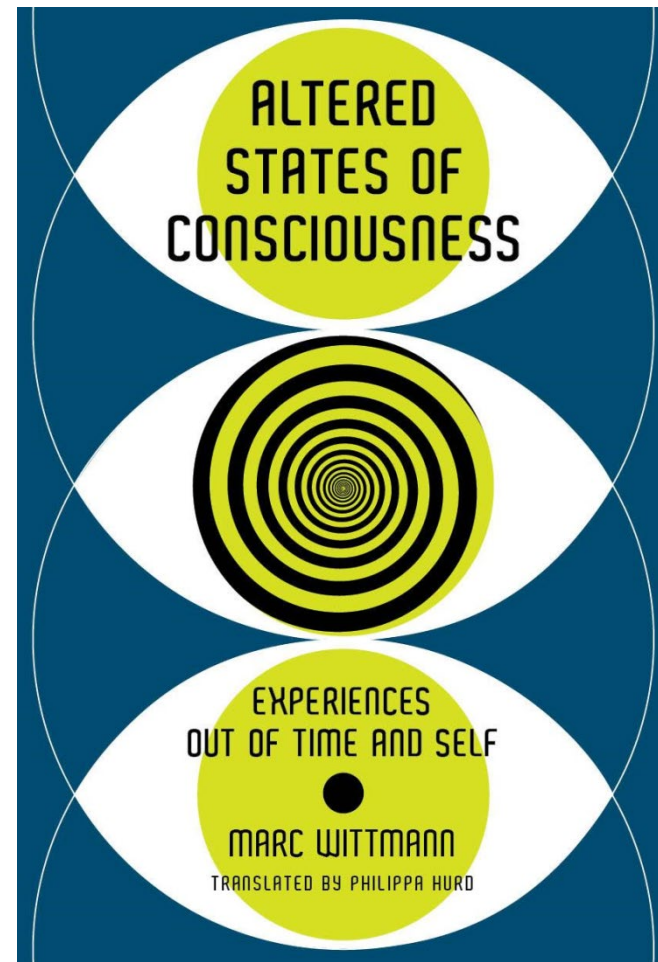
Drugs, Psychedelics

Video Gaming

Music

Sexual orgasm

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# Measures on subjective time

Time passage, judgment of duration, time awareness

How fast did time pass for you?

extremely slowly |-----| extremely fast

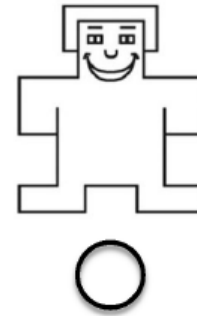
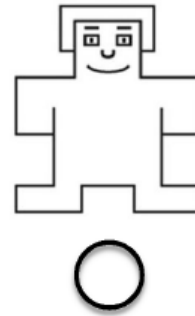
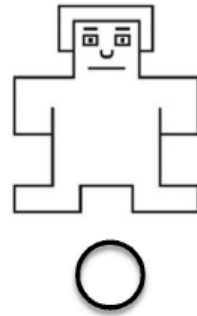
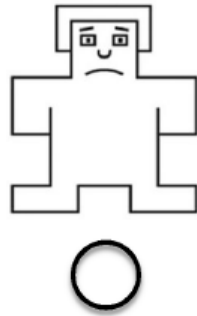
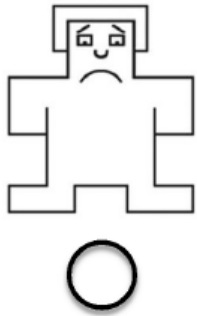
How long did the time interval last?

How often did you think about time?

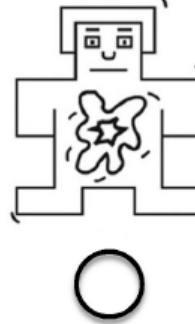
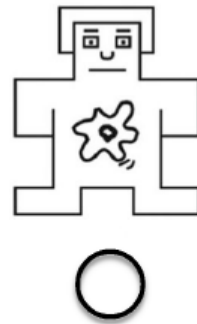
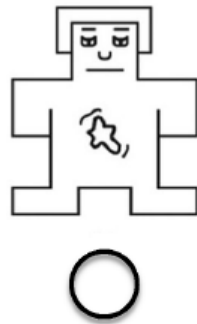
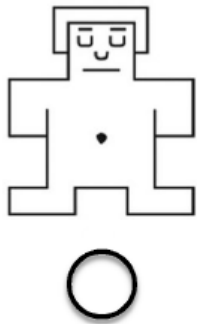
Not at all

Extremely  
often

How positive or negative do you feel right now?



How aroused or calm do you feel right now?



How relaxed did you feel most of the time?

extremely  
tense



extremely  
relaxed

Waiting time

**Waiting under uncertainty of duration**



# Waiting time

- $N = 82$  students
- Waiting period in empty room containing only desk and chair; no distraction; watches, cell phones, etc. taken away
- Explicit (“accidental”) waiting time
- Instruction: “Please sit here on the chair and wait for me to come back”
- Waiting **7.5 minutes**



## Emotion & Time

Mean judged duration: 8.4 min.; range: 2.5 – 19 min.

- ⇒ **The more negative affect**, the longer judged duration, the slower passage of time
- ⇒ **The more emotional arousal**, more often thoughts about time, the slower passage of time
- ⇒ **The more relaxed**, the shorter judged duration, the faster passage of time

Rating	Time estimation duration (min.)	How often did you think about time? VAS (0–100)	How fast did time pass for you? VAS (0–100)
% Sense of past [0 ... 100]	-0.128	-0.054	-0.037
% Sense of presence [0 ... 100]	0.220*	0.250*	-0.125
% Sense of future [0 ... 100]	-0.195	-0.243*	0.147
SAM valence [1 ... 5]	-0.303***FDR	-0.262*	0.304***FDR
SAM arousal [1 ... 5]	0.262*	0.301***FDR	-0.361***FDR, BF
Sense of body [0 ... 6]	0.205	0.146	-0.101
Sense of space [0 ... 6]	0.121	-0.052	-0.230*
Level of relaxation [0 ... 100]	-0.278***FDR	-0.024	0.474***FDR, BF
Level of being awake [0 ... 100]	-0.239*	-0.079	-0.043

# Meditative silence



## Meditative silence : Silence after seminar

- N = 60 students in two separate groups (within-subject group design)
- Depth Relaxation Music Therapy (DRMT) → body-centered meditation
- **6.5 minutes of silence**
  - (1) after 16 minutes body-centered meditation induction vs.
  - (2) after 16 minutes of seminar about meditation
- Advantage: No problem with control condition : both are identical
- One week apart between two sessions, counter-balanced in order

## 6.5 minutes of silence: Meditation vs. Seminar

- After meditation vs. seminar:
- More relaxed
  - Less awareness of sense of time
  - **Relative overestimation of duration**

<b>Measure</b>	<b>Meditation</b>	<b>Seminar</b>	<b>t =</b>
	Mean (S.D.)	Mean (S.D.)	<b>p &lt;</b> (df = 59)
State of relaxation [0 ... 100]	75.6 (18.3)	62.2 (24.0)	<b>-3.8</b> <b>0.001*</b>
Awareness of sense of time [0 ... 100]	29.1 (23.3)	39.2 (25.4)	<b>2.5</b> <b>0.014*</b>
Speed of time passage [0 ... 100]	56.8 (24.6)	62.7 (22.8)	1.5 0.148
Duration of period of silence [min.]	10.3 (4.2)	6.8 (2.3)	<b>-6.5</b> <b>0.001*</b>

# Meditation in City Garden : Seminar in City Garden



# Meditation vs. Seminar in **City Garden**

- N = 84 students in two separate groups (within-subject group design)
- Depth Relaxation Music Therapy (DRMT)/Hypnomusictherapy (HMT)  
→ body-centered meditation-type induction
- **6.5 minutes of silence**
  - (1) after 16 minutes body-centered meditation induction vs.
  - (2) after 16 minutes of seminar about meditation
- **Meditation vs. Seminar in more natural surrounding (city garden)**

# Meditation vs. Seminar in **City Garden**

After meditation vs. seminar:

- **Slower passage of time**
- **Relative overestimation of duration**

<b>Measure</b>	<b>Meditation</b>	<b>Seminar</b>	<b>t =</b>
	Mean	Mean	<b>p &lt;</b>
	(S.D.)	(S.D.)	(df = 59)
State of relaxation [0 ... 100]	71.6 (21.7)	66.5 (21.5)	-1.7 0.087
Awareness of sense of time [0 ... 100]	40.0 (28.7)	35.6 (27.2)	-1.1 0.258
Speed of time passage [0 ... 100]	51.9 (24.6)	66.1 (22.8)	<b>4.9</b> <b>0.001*</b>
Duration of period of silence [min.]	11.7 (7.0)	7.3 (2.9)	<b>-5.6</b> <b>0.001*</b>

# Changes in subjective time and self after meditation in experienced meditators

Participants: 22 mindfulness meditators; mean age =  $47.18 \pm 12.45$

Secular mindfulness meditation 2; Vipassana meditation 8; Zen Buddhism 8; Tibetan Buddhism 4

	Meditation Experience
Lifetime in years (mean $\pm$ SD)	$19.16 \pm 14.83$
Lifetime in hours (mean $\pm$ SD)	$2994.22 \pm 3213.44$
In hours per week (mean $\pm$ SD)	$4 \pm 2.08$

- **20 minutes**

- (1) self-guided meditation

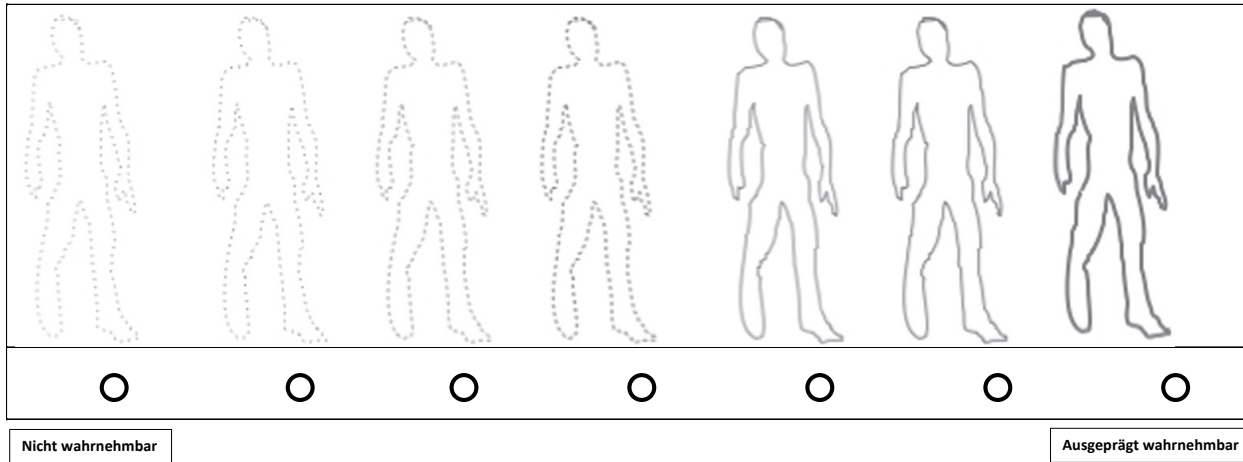
- (2) read an excerpt of a novel while adopting the same bodily posture as in the meditation session



# Changes in subjective time and self after meditation in experienced meditators

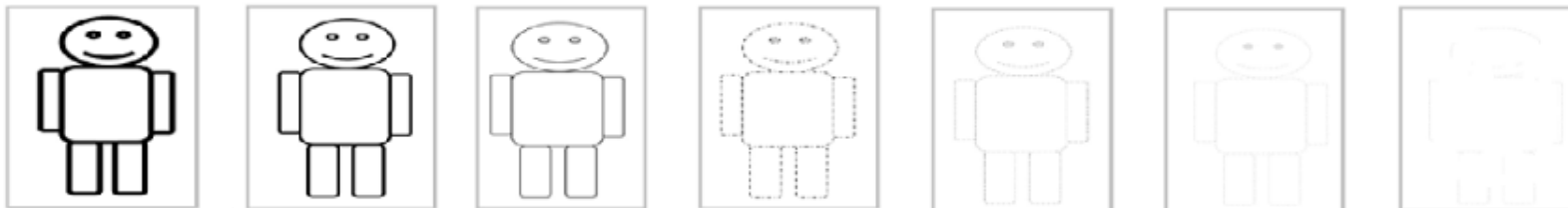
How intensive did you experience your body boundaries?

Wie intensiv haben Sie Ihre Körpergrenzen wahrgenommen?



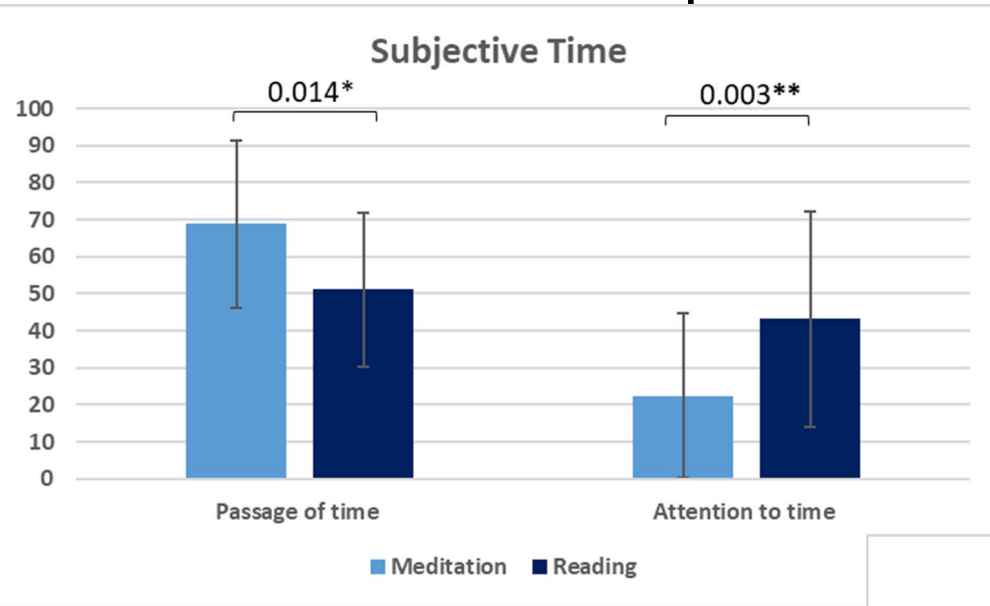
The Perceived Body Boundaries Scale: Dambrun 2016

How intensive did you experience your body?



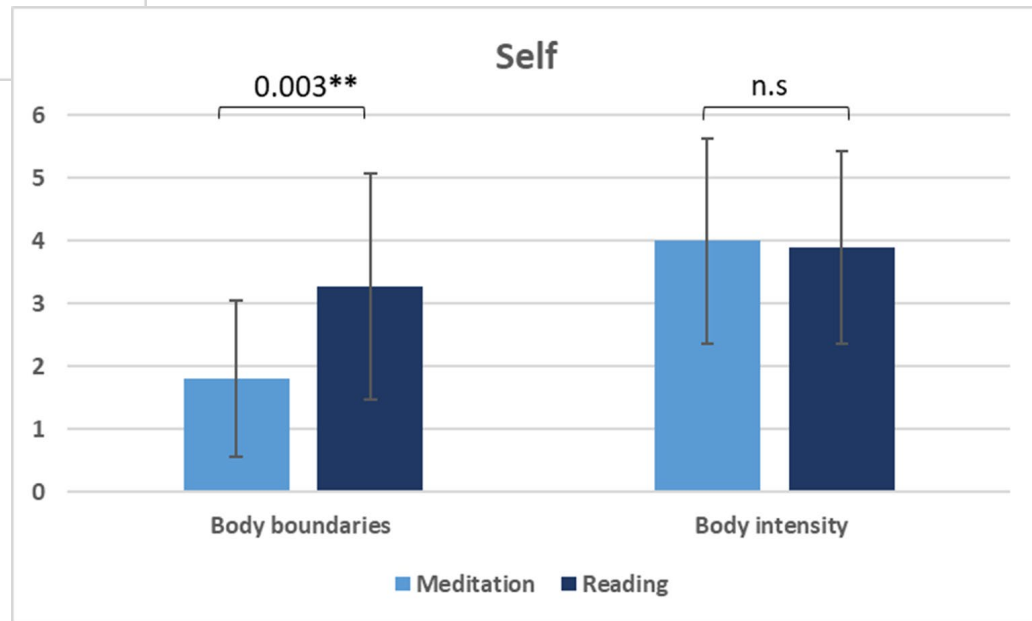
STSS: Pfeifer et al. 2016

# Changes in subjective time and self after meditation in experienced meditators



Meditation:  
- Less attention to time  
- Faster passage of time

Meditation:  
- Less self boundary



## Comparing meditation and hypnosis: self-experience

Non-experienced meditators: Time expands / passes slowly

Experienced meditators: Time contracts / passes fast

During **hypnosis**:

Duration relatively underestimated / faster passage of time

(Naish 2007)

Etzel Cardeña: Hypnosis

Stefan Schmidt: Mindfulness meditation