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Assessing the processes underlying mindfulness training

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Introduction

Mindfulness is “paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Multi-component mindfulness trainings demonstrably foster various psychological functions, but less is known about contributions of individual components, such as different mindfulness exercises.

Goal: To investigate active ingredients of mindfulness training in terms of the **incremental value of yoga** within mindfulness training in respect of **cognitive effects** by comparing:

- Mindfulness training including yoga (MYT)
- Mindfulness training excluding yoga (MT)
- Awareness training (active control)
- No treatment (passive control)

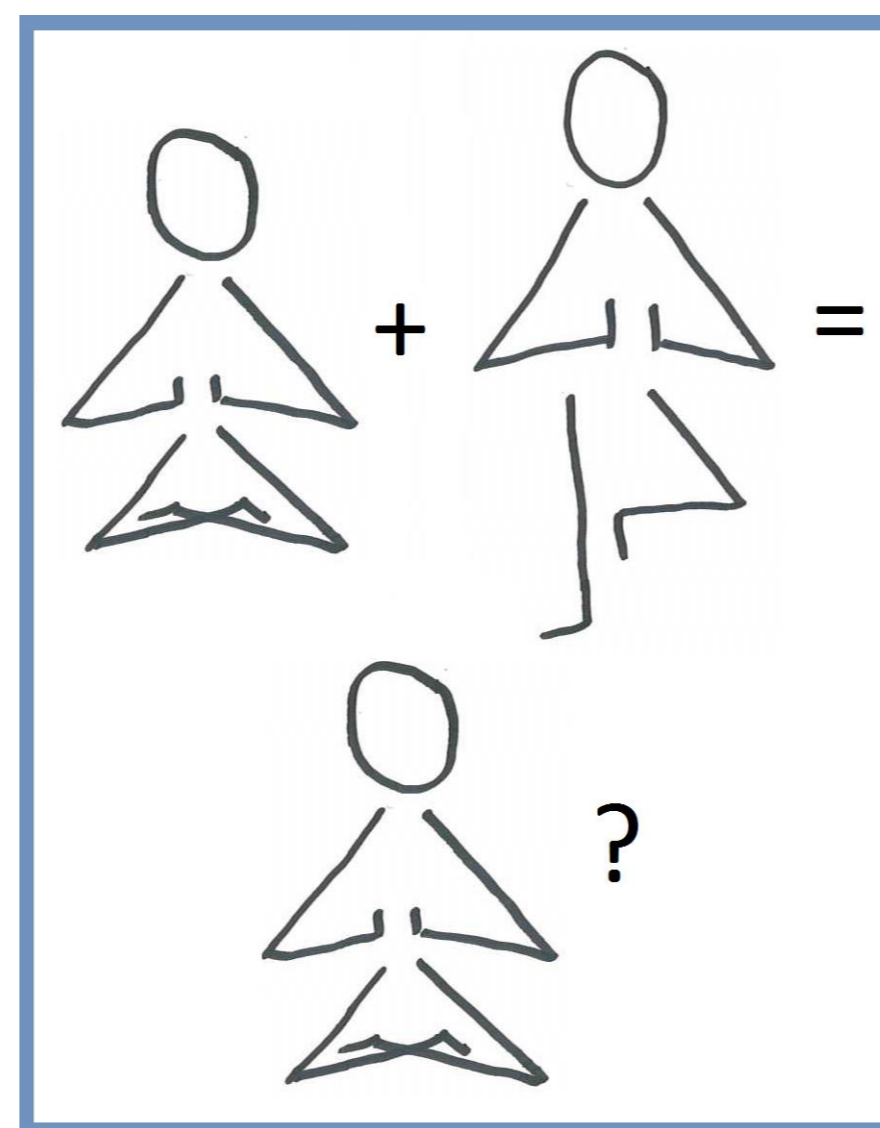
Hypotheses: Considering **attention regulation** as core component of mindfulness, we expected that

- Mindfulness training results in greater gains in cognitive performance than awareness training (active control group) and no training (passive control group).
- Including yoga in mindfulness training is not associated with an extra gain in cognitive performance.

Method

Design and Interventions

Group	T1	Treatment over 1 semester	T2
MYT (n=60)	Pretest	Mindfulness training incl. sitting meditation, body scan, yoga	Posttest
MT (n=44)	Pretest	Mindfulness training incl. sitting meditation, body scan	Posttest
Active control (n=45)	Pretest	Phenomenological awareness training	Posttest
Passive control (n=31)	Pretest	-	Posttest



Participants: 180 university students (age: mean=24.92, SD=3.53; gender: 38.33% male)

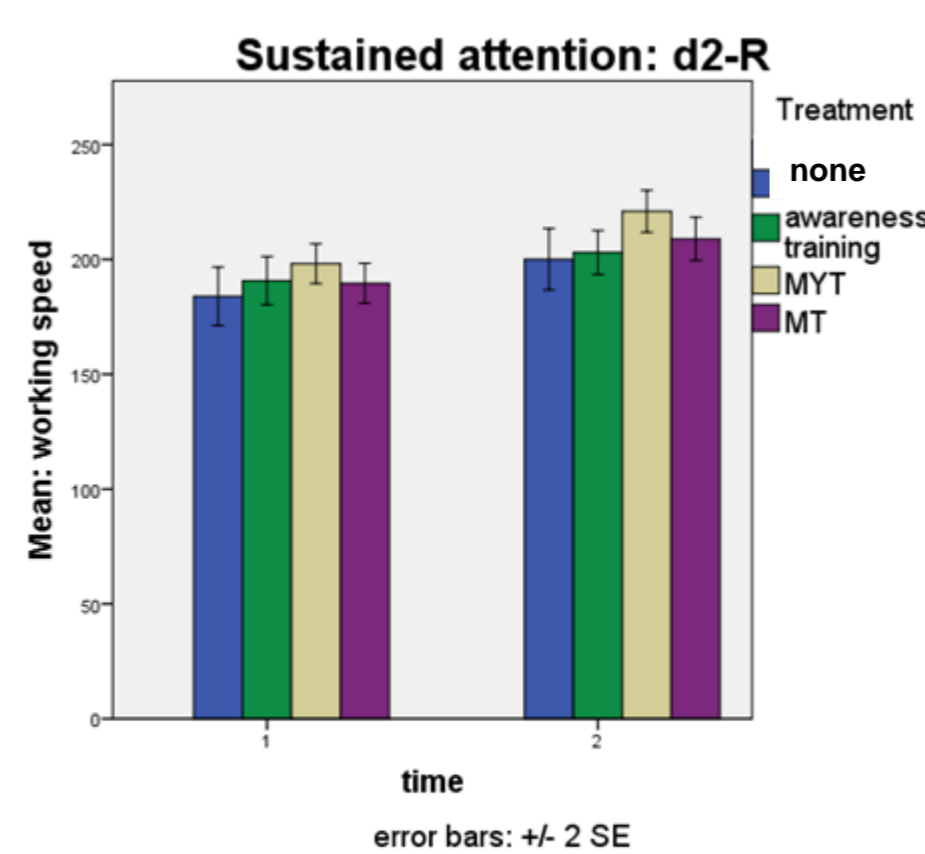
Dependent Measures

- Sustained attention: d2-R (Brickenkamp et al., 2010)
- Cognitive flexibility: Number-letter task (Rogers & Monsell, 1995)
- Cognitive inhibition: Flanker task (Eriksen & Eriksen, 1974)
- Data-driven information processing: among others recognition of prototypical faces (adapted from Solso & McCarthy, 1981)

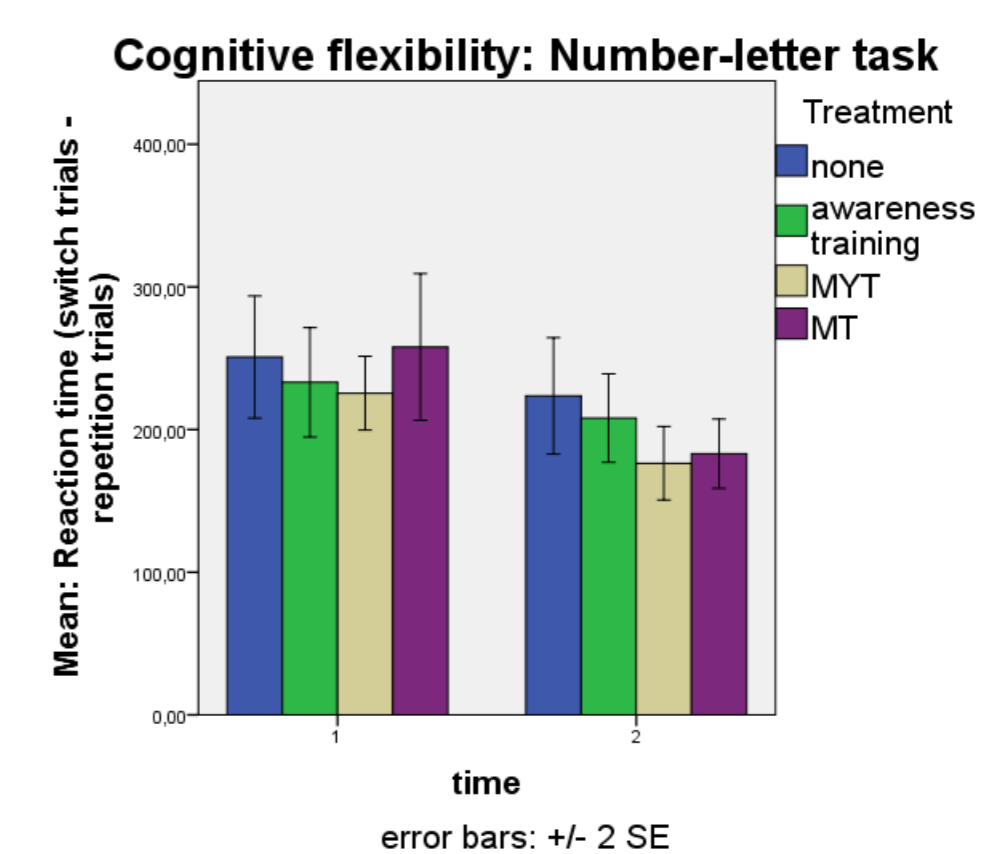
Results

General approach for analyses:

- Linear mixed-effects modeling
- Contrasts: passive control vs. mindfulness training, passive control vs. active control, MT vs. MYT
- Predictors: participant, gender, time (pre vs. posttest), group (passive control vs. active control vs. MT vs. MYT), interaction of time with group
- Graphs display results of selected dependent measures and are accompanied by **significant contrasts**.
- Moderation analyses showed that results were not affected by practice time.

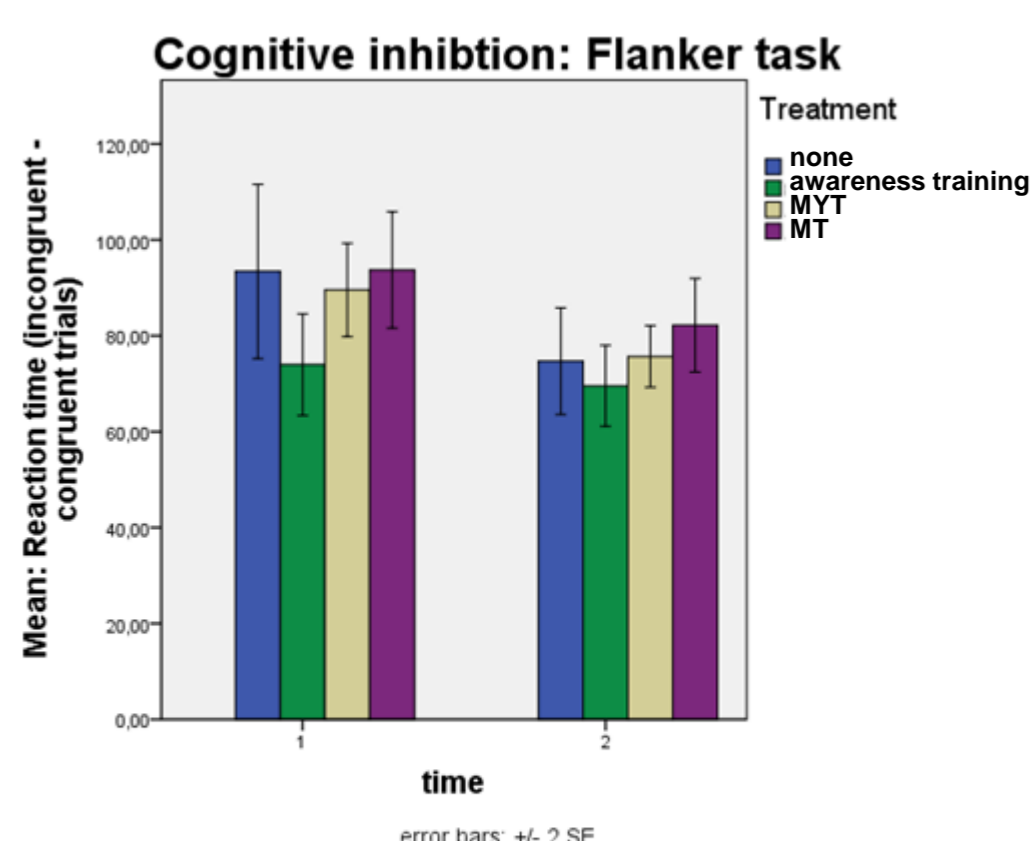


Passive control vs. mindfulness training:
 $b = 3.41, t(173) = 2.07, p = .04, r = .02$
Passive control vs. active control:
 $b = -5.36, t(173) = -1.92, p = .06, r = .02$

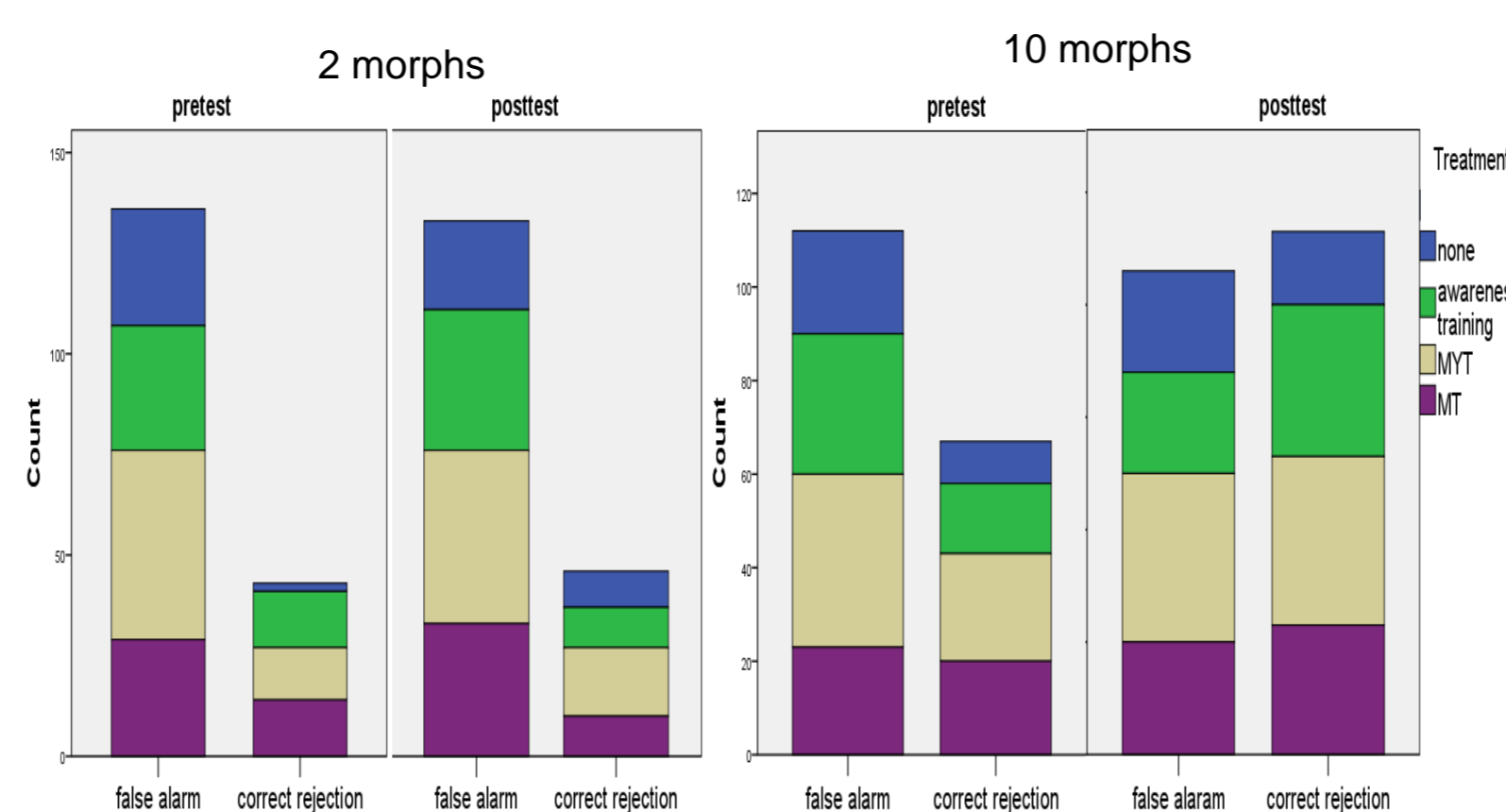


Passive control vs. mindfulness training:
 $b = -18.04, t(171) = -1.96, p = .05, r = .02$

Data-driven information processing: recognition of prototypical faces



Passive control vs. active control:
 $b = 7.72, t(173) = 2.00, p = .05, r = .02$



Passive control vs. MT:
 $B = 2.05, SE = 1.07, p = .06$
Passive control vs. active control:
 $B = 2.86, SE = 1.07, p = .008$

Conclusions

- There is tentative support for the hypothesis that **mindfulness training** is accompanied by improved cognition in terms of **sustained attention, cognitive flexibility, and data-driven information processing**.
- As expected, including **yoga** in mindfulness training is **not** associated with an **extra gain** in cognitive performance.
- Results confirm our prediction that improving cognitive functions requires systematic attention training as provided in meditation and bodyscan.

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