

Not a magic pill - Evidence of absence for cognitive enhancement after a three-week open-label placebo treatment in healthy young adults

Helena Hartmann¹, Katarina Forkmann¹, Katharina Schmidt¹, Julian Kleine-Borgmann¹, Johanna Albers¹, Katja Wiech², & Ulrike Bingel¹

¹ Department of Neurology, Center for Translational Neuro- and Behavioral Sciences, University Medicine Essen, Essen, Germany

² Nuffield Department of Clinical Neurosciences, John Radcliffe Hospital, University of Oxford

INTRODUCTION

- Evidence that deceptive placebos can enhance cognitive performance¹ → what about open-label placebos (OLPs)?
- Clinical evidence that OLPs can relieve symptoms such as pain, fatigue, depression, allergies, etc.²
- Previous study in stressed medical students found no direct effects of OLP treatment on exam results³
- More studies find effects on subjective as compared to objective parameters of cognitive performance
- Cognitive performance is a wide field with many domains

METHODS

Sample

- Preregistration: <https://drks.de/search/de/trial/DRKS00019203>
- Healthy adults, mean age = 28.45 years
- $N = 100$ (excl. 12 dropouts, 5 with technical issues and 5 who took the OLP less than 70% of the time) → $n_{OLP} = 40$, $n_{CTR} = 38$

Measures

- A large battery of objective tasks and subjective questionnaires measuring objective cognitive performance or its subjective perception
- Measures of general well-being (sleep, stress, mood, activity, etc.)

Subjective parameters

VAS EFFORT
Please indicate how effortful the task today was for you personally.

not at all effortful Very effortful

Pause: 2000ms

VAS SATISFACTION
Please indicate how satisfied you are today with your personal performance in this task.

not at all satisfied Very satisfied

Pause: 2000ms

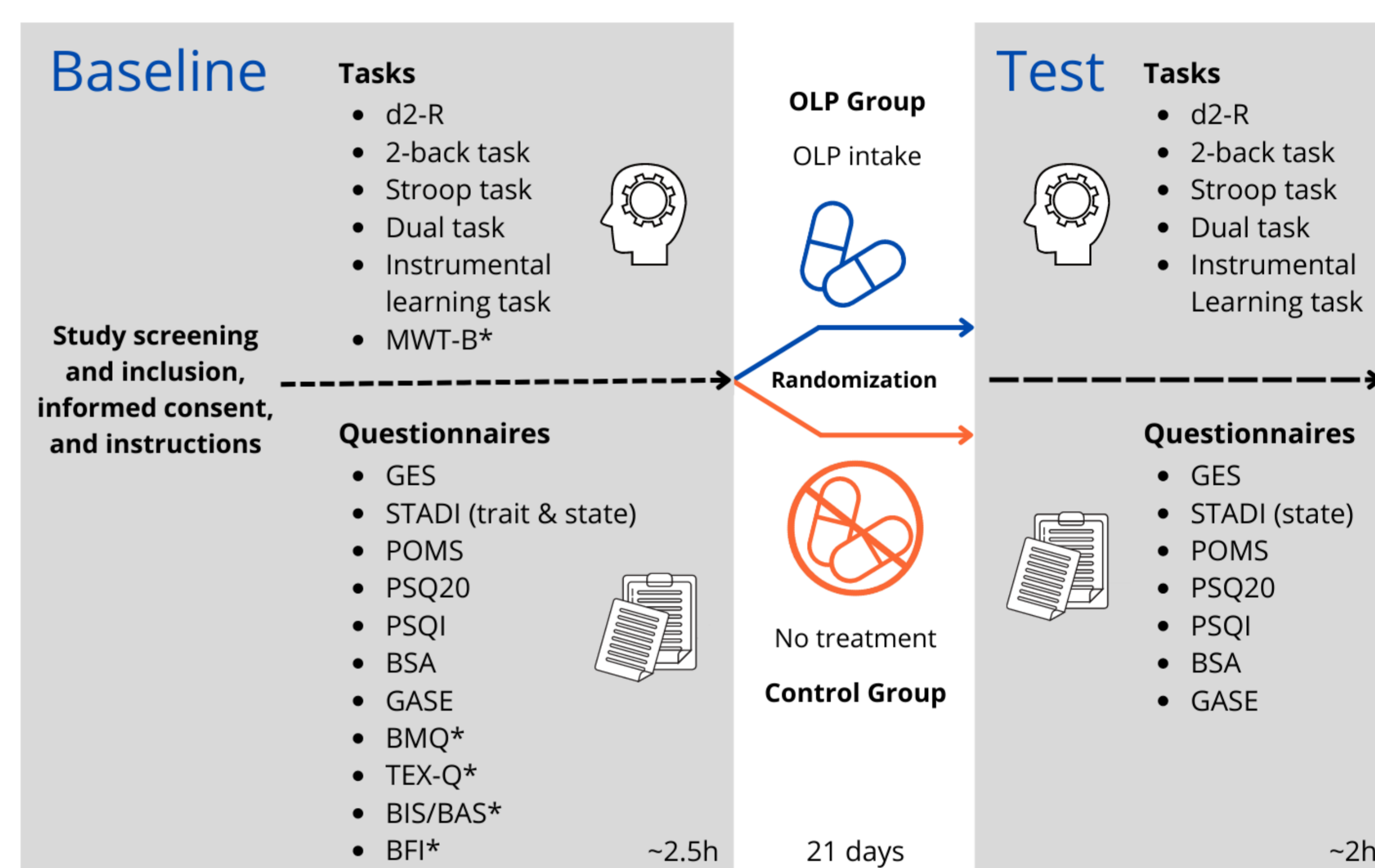
VAS CHANGE
Please estimate how you performed today in comparison to the last test session in this task.

much worse much better

Research question and hypothesis

Does a 3-week open-label placebo treatment improve different objective and subjective parameters of cognitive performance as well as general well-being?

Study design



d2-R = Attention and Concentration Test; MWT-B = Multiple Choice Vocabulary Intelligence Test; GES = Health Questionnaire; STADI = State-Trait-Anxiety-Depression-Inventory; POMS = Profile of Mood States; PSQ20 = Perceived Stress Questionnaire; PSQI = Pittsburg Sleep Quality Index; BSA = Movement and Sports Activity Questionnaire; GASE = Generic Assessment of Side Effects; BMQ = Beliefs About Medicines Questionnaire; TEX-Q = Treatment Expectation Questionnaire; BIS/BAS = Behavioral Inhibition/Behavioral Approach System Questionnaire; BFI = Big Five Inventory; OLP = open-label placebo.

Objective parameters

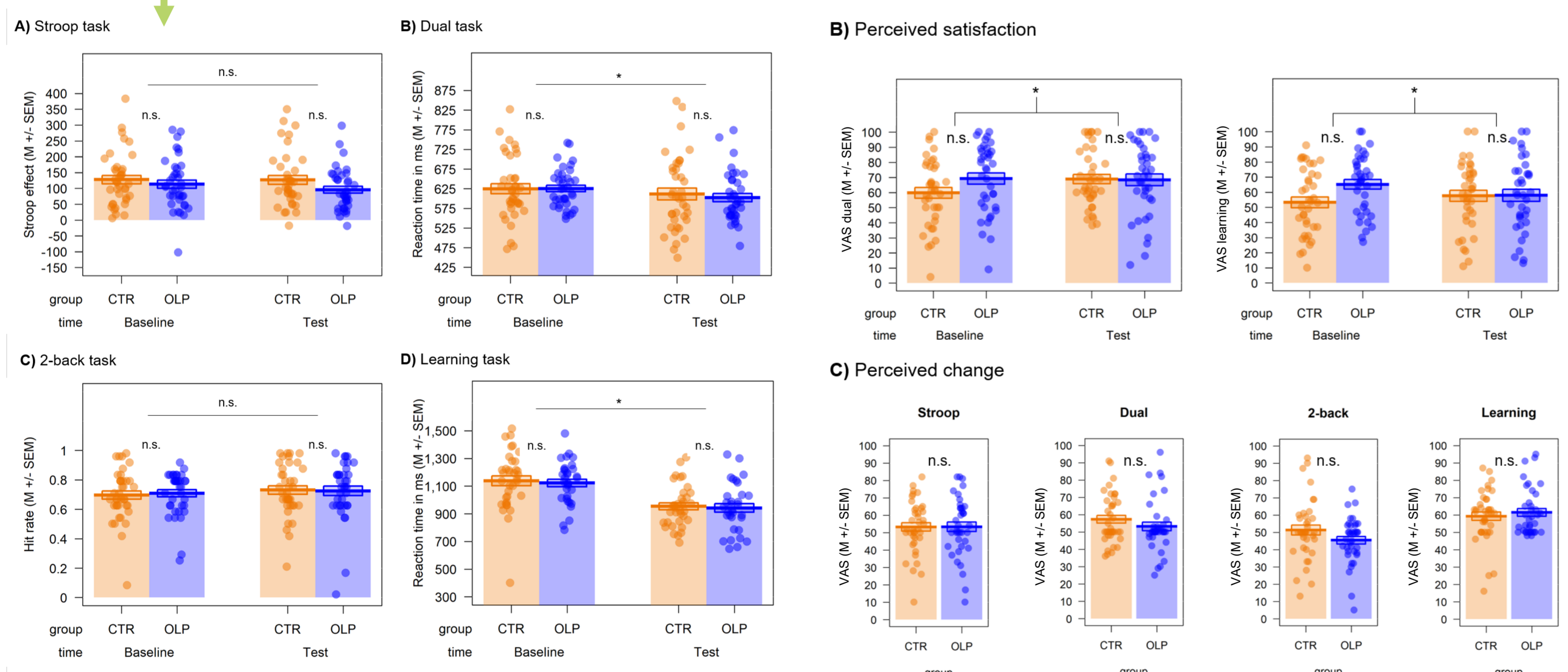
- Stroop task
- Dual task
- 2-back task
- Learning task
- d2 task



Scan the QR-code for figures of the tasks

RESULTS

Subjective performance →
vs.
Objective performance ↓



DISCUSSION

- No effects of the OLP treatment on any objective or subjective parameters
- OLP group had no (positive) expectations or belief regarding the OLP treatment, and was less satisfied with their group allocation ($p = .008$)
- OLPs may work, but possibly only in certain contexts, demonstrating limits of OLPs for certain domains
- Clinical vs. healthy samples: Importance of a direct burden, need of relief & wished symptom improvement
- Influence of positive or negative treatment expectations still unclear

REFERENCES

- 1) Schmidt et al., 2014; Schwarz & Büchel, 2015
- 2) e.g., Schaefer et al., 2016; Zhou et al., 2019; Kelley et al., 2012; Carvalho et al., 2021
- 3) Kleine-Borgmann et al., 2021

Icons by <https://fontawesome.com/>

CONTACT



Dr. Helena
Hartmann

0000-0002-1331-6683

helena.hartmann@uk-essen.de

@helenahartmann



Personal
website