# The relation between memory and exam performance - modulation with Methylphenidate

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The present study aims to examine whether memory improvement, caused by Ritalin (MPH) intake, has a positive effect on exam performance.

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| **Ethical review** | Approved WMO |
| **Status** | Recruiting |
| **Health condition type** | Other condition |
| **Study type** | Interventional |

## Summary

### ID

NL-OMON52652

**Source**
ToetsingOnline

**Brief title**
Memory and exam performance

### Condition

- Other condition

**Synonym**
not applicable

**Health condition**

geen aandoening

**Research involving**
Human

## Sponsors and support

**Primary sponsor:** Universiteit Maastricht
**Source(s) of monetary or material Support:** Ministerie van OC&W

## Intervention

**Keyword:** Cognition enhancement, Exam performance, Memory, Methylphenidate

## Outcome measures

### Primary outcome

The main study parameters are measures of exam performance. In our case, this means the number of correct responses to the factual exam questions (i.e., memory) as well as the questions related to understanding.

### Secondary outcome

We will use a series of well-established memory paradigms to evaluate the level of cognitive enhancement. We will additionally test the effect of enhanced cognition on inducing a liberal response criterion. Therefore, in addition to the other paradigms used, we will include measures to assess false memory formation, and check whether MHP contributes to formation of such memories. The study parameters for the secondary objectives are behavioral data from the (false) memory paradigms. Additionally, we will include a working memory capacity task and survey questions measuring mood and alertness to exclude possible confounding effects of these factors.

# Study description

### Background summary

The worldwide prevalence of pharmacological cognitive doping among university

students ranges between 1.3-33% depending on the country. In the Maastricht University newspaper, it was reported that a quarter of all students have at least once used *smart drugs*, like Ritalin (MPH). Despite the fact that many students believe that these psychostimulants will improve their study results, there is no experimental evidence in support of this. Several publications have shown cognition enhancement under controlled experimental conditions. These studies typically found working and declarative memory improvement in healthy adults after drug intake. However, it is yet unknown if the magnitude of these experimental effects is large enough to be translated into *real-world* advantages such as in learning for and performing on an exam. More specifically, it remains unclear whether improved performance on memory and an exam are related to encoding (acquiring new information) or retrieval (recollecting information).

### Study objective

The present study aims to examine whether memory improvement, caused by Ritalin (MPH) intake, has a positive effect on exam performance.

### Study design

The experiment will utilize a randomized, double-blind and placebo-controlled between-subjects design.

### Intervention

Given the between-subjects design, subjects will either receive placebo or 20 mg methylphenidate. The medication will be administered orally. The participants will be asked to perform various tests related to cognitive performance and an exam probing factual knowledge vs. insight.

### Study burden and risks

The time investment for the participants will be around 380 min, which is comprised of 1) filling in a medical questionnaire (30 min), 2) training of 30 min and 3) two test sessions each of around 160 min. The day before their test day, the participants are not allowed to drink any alcohol. On the test day, participants are not allowed to smoke or drink caffeinated drinks. Furthermore, they are asked to refrain from using drugs throughout the study.

## Contacts

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# Trial sites

## Listed location countries

Netherlands

# Eligibility criteria

**Age**
Adults (18-64 years)

## Inclusion criteria

• In the opinion of the investigator, the participant is capable of understanding and complying with protocol requirements.
• The participant has a body mass index of 18.5-30 kg/m2, inclusive, at the medical screening.
• The participant is aged 18 to 35 years, inclusive, at the time of informed consent.
• The volunteer is healthy, i.e. absence of all exclusion criteria and had normal or corrected to normal static binocular acuity with or without correction.
• The participant signs and dates a written informed consent form before the start of the experiment.
• The participant has sufficient English language skills to read and understand all instructions and perform the tasks in this study

## Exclusion criteria

• The volunteer has an uncontrolled, clinically significant neurologic, cardiovascular, pulmonary, hepatic, renal, metabolic, gastrointestinal, or

endocrine disease or other ab-normality, which may impact the ability of the subject to participate or potentially confound the study results.
• The volunteer has existing major psychiatric symptoms.
• The participant has known hypersensitivity to any component of the formulation or methylphenidate or related compounds.
• The participant has a history of drug abuse (defined as any illicit drug use) or a history of alcohol abuse within 1 year prior to the first visit or is unwilling to agree to abstain from alcohol from 24 hours prior to each test day and/or drugs throughout the study.
• The participant has been diagnosed with ADHD.
• The participant has any sensory or motor deficits, which could reasonably be expected to affect test performance.
• Other exclusion criteria are excessive drinking (>20 glasses of alcohol-containing beverages a week), pregnancy or lactation, use of medication other than oral contraceptives, use of recreational drugs from 2 weeks before until the end of the experiment, any condition in which gastrointestinal motility might carry any risk.
• The participant has dyslexia.

# Study design

## Design

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| Study type: | Interventional |
| Intervention model: | Parallel |
| Allocation: | Randomized controlled trial |
| Masking: | Double blinded (masking used) |
| Control: | Placebo |
| Primary purpose: | Other |

## Recruitment

NL

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|---|---|
| Recruitment status: | Recruiting |
| Start date (anticipated): | 12-11-2020 |
| Enrollment: | 80 |
| Type: | Actual |

# Ethics review

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| Approved WMO Date: | 24-12-2019 |
| Application type: | First submission |
| Review commission: | METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht) |

# Study registrations

## Followed up by the following (possibly more current) registration

No registrations found.

## Other (possibly less up-to-date) registrations in this register

No registrations found.

## In other registers

| Register | ID |
|---|---|
| CCMO | NL71282.068.19 |