# Cognitive functioning under different social psychological conditions

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The key objectives of the performance tests in the present study are:- To test for the effect of performance pressure during intellectual assessment on MZ and DZ twins. - To study how genetic and environmental estimates derived from path models of...

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| **Ethical review** | Approved WMO |
| **Status** | Pending |
| **Health condition type** | Other condition |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON31152

**Source**
ToetsingOnline

**Brief title**
Cognitive functioning

### Condition

- Other condition

**Synonym**
cognition, performance

**Health condition**

Individuele verschilllen in cognitief functioneren onder druk

**Research involving**
Human

## Sponsors and support

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

## Intervention

**Keyword:** cognition, genes, performance

## Outcome measures

### Primary outcome

Cognitive skills, as measured with standardized IQ test and two Working Memory

tasks.

The experience of pressure during the task performance

### Secondary outcome

Rest EEG

# Study description

### Background summary

It is known that people perform more poorly than expected, given one's skill, in situations where the pressure to perform is high (i.e., where the desire to excel is maximal ; see Baumeister,1984; Beilock, Kulp, Holt, & Carr, 2004). As noted by Beilock and Carr (2005), the consequences of suboptimal performance, especially on examinations, include poor evaluations by mentors, teachers, and peers, lost scholarships, and relinquished educational and employment opportunities. By investigating the relationship between performance pressure and individual differences in working-memory capacity (WMC), these authors observed that the individuals most likely to fail under performance pressure are those who, in the absence of pressure, have the highest potential for success (i.e., high-WMC individuals). Performance pressure, they reasoned, hinders the most qualified people by consuming the WMC they use in low-pressure circumstances to devise complex (resource demanding) strategies and produce superior performance. In their study, however, Beilock and Carr (2005) focused only on arithmetic problems (involving both subtraction and division). More recently, Gimmig, Huguet,Caverni and Cury (2006) examined the generality of

Beilock and Carr's (2005) conclusion using a task (Raven*s Standard Progressive Matrices or SPMs) known to measure fluid intelligence (Gf), and they revealed that pressure to perform high in high-powered people is not confined to tasks involving acquired skills and knowledge but encompasses fluid reasoning abilities or intelligence. These findings help us to understand how individuals who score high versus low on working memory tests, perceive high performance pressure situations. Taken together, these new findings have strong implications for the assessment of people's intellectual capacity.

**Study objective**

The key objectives of the performance tests in the present study are:

- To test for the effect of performance pressure during intellectual assessment on MZ and DZ twins.

- To study how genetic and environmental estimates derived from path models of the classical twin study differ according to the performance pressure condition (pressure vs non-pressure).

Previous studies have tried to link IQ performance to resting state EEG characteristics, e.g., power, coherence, and long-range temporal correlations in amplitude fluctuations (Smit et al., 2005; Linkenkaer-Hansen et al., in prep). Only low correlations between these measures of brain organisation and cognitive ability have been reported. In part, these low correlations may reflect the poor standardization of resting-state EEG recordings as well as the failure to account for individual differences in sensitivity to performance pressure during IQ testing.

**Study design**

Test research, questionnaires, statistical analyses

**Study burden and risks**

Participants have to visit the VU when they are 17 or 18 years old for a 5 hour test session. They have to perform three computerised cognitive tasks. During this performance their heart rate and cardiac sympathetic and parasympathetic control are measured by non-invasive recording of the ECG and the thorax impedance cardiogram (7 spot electrodes). Blood pressure will be measured before the testing session and afterwards. In addition length and weight will be measured.
There are two testing conditions: in one condition participants will experience pressure to perform well, in the other condition participants will experience no pressure. The instructions by the experimenter before the testing session determines the condition (see appendix 1). After the cognitive tasks subjects

are asked to fill in 4 computerised questionnaires. The cognitive assessment is followed by a debriefing (see appendix 2). After a break (lunch) they will undergo two eyes-closed rest EEG experiments of 5-¬10 minutes followed by a multiple-choice questionnaire about their experiences during the experiment. The EEG session will take up to one and a half hour, including the preparation of the 128-channel EEG cap.
Parents of the participants and the participants themselves are asked to collect at home (one week before the assessment) DNA by buccal (cheek) swabs.

## Contacts

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## Trial sites

### Listed location countries

Netherlands

## Eligibility criteria

**Age**
Adolescents (12-15 years)
Adolescents (16-17 years)
Adults (18-64 years)
Elderly (65 years and older)

### Inclusion criteria

Twins who participated before in cognition research of the NTR

### Exclusion criteria

Children who suffer from severe physical or mental handicaps

## Study design

### Design

**Study type:** Observational non invasive

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| Masking: | Open (masking not used) |
| Control: | Uncontrolled |
| Primary purpose: | Basic science |

### Recruitment

NL

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| Recruitment status: | Pending |
| Start date (anticipated): | 01-06-2007 |
| Enrollment: | 240 |
| Type: | Anticipated |

## Ethics review

Approved WMO

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| Application type: | First submission |
| Review commission: | METC Amsterdam UMC |

## 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 | NL17869.029.07 |