

Brein, Leefstijl en Leren

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Brein, Leefstijl & Leren

Psychobiological determinants for learning and cognition in lifelong perspective

Renate de Groot

Biopsychological determinants

- Physical activity (sports, life style, commuting)
- Nutrition (fish consumption, breakfast consumption, caffeine)
- Sleep (quality, duration, time)
- Vitality (mental fatigue, mood)

Lifelong

- Prenatal (Childhood)
- Adolescence
- Adulthood
- Aging

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LIFE COURSE EPIDEMIOLOGY

Prenatal famine exposure and cognition at age 59 years

Renate H.M. de Groot,^{1,2} Arjan D. Smeets,¹ Adrie Jellema,¹ Martin P.J. van Boxtel,¹ Gerard-Jan Blom,³ Miepelt van de Brel,¹ and L.L. van der Lely^{1,4}

Background: Despite the potential importance of early life nutrition for mental development, few studies have related gestational undernutrition to later-life cognitive functioning. We investigated the consequences of gestational exposure to the Dutch famine of 1944-45 for cognitive functioning at the age of 59 years.

Methods: We recruited men and women who were all born in both districts in Nieuw-Amsterdam, Rotterdam and Leidschendam between January 1944 and March 1946, whose mothers reported fasting during or immediately preceding pregnancy ($n=146$). Of them, in the same three institutions during 1943 and 1947 whose mothers did not experience famine during this pregnancy ($n=202$) or 140, respectively. The height of those in the two time categories ($n=311$). We assessed cognitive performance at the age of 59 years by means of a composite cognitive test battery.

Results: All cognitive functioning test scores were within normal ranges for the age group. There were no differences in cognitive performance at the age of 59 years between individuals exposed to gestational undernutrition and those without this exposure. For the overall cognitive index, a summary measure across six functional domains (mean IQ, standard deviation (SD) of 2.07 points), famine exposure was associated with a decrease of 0.27 points (95% confidence interval (CI) -2.41 to 1.87) versus individuals exposed to normal index 4.16 (95% CI 4.64-4.67) points lower than those without this exposure. Within-district analyses gave consistent results.

Conclusion: We found no overall association between maternal exposure to severe famine in pregnancy and cognitive performance of the offspring at the age of 59 years, but cannot rule out an association specific to early pregnancy exposure.

Eating the right amount of fish

Inverted U-shape association between fish consumption and cognitive performance and academic achievement in Dutch adolescents

Renske M. M. de Groot,¹ Carlijn Oudejans,¹ Jelle Jellema

Background: Fish consumption is associated with cognitive performance and academic achievement. However, the shape of this association is unclear. We investigated the relationship between fish consumption and cognitive performance and academic achievement in Dutch adolescents.

Methods: We recruited 101 healthy Dutch high school students aged 16-17 years. We assessed cognitive performance and academic achievement by means of a composite cognitive test battery and a standardized academic achievement test. We also assessed fish consumption by means of a validated questionnaire.

Results: We found an inverted U-shape association between fish consumption and cognitive performance and academic achievement. The relationship was strongest for the cognitive test battery and for the academic achievement test. The relationship was also strongest for the cognitive test battery and for the academic achievement test.

Conclusion: We found an inverted U-shape association between fish consumption and cognitive performance and academic achievement in Dutch adolescents.

Fatiguing the Brain: The Effect of Induced Fatigue on Brain Function During Working Memory

Renske M. M. de Groot,¹ Carlijn Oudejans,¹ Jelle Jellema

Background: Working memory is a limited resource. Induced fatigue may affect working memory performance. We investigated the effect of induced fatigue on brain function during working memory.

Methods: We recruited 101 healthy Dutch high school students aged 16-17 years. We assessed working memory performance by means of a standardized working memory test. We also assessed brain function by means of a standardized brain function test.

Results: We found that induced fatigue affected working memory performance and brain function during working memory.

Conclusion: Induced fatigue affects working memory performance and brain function during working memory.

Improvement in physical functioning protects against cognitive decline: A 6-year follow-up in the Maastricht Aging Study

Renske M. M. de Groot,¹ Carlijn Oudejans,¹ Jelle Jellema

Background: Physical functioning is associated with cognitive performance. We investigated whether improvement in physical functioning protects against cognitive decline.

Methods: We recruited 101 healthy Dutch high school students aged 16-17 years. We assessed physical functioning and cognitive performance by means of standardized tests.

Results: We found that improvement in physical functioning protected against cognitive decline.

Conclusion: Improvement in physical functioning protects against cognitive decline.

Breйн,
Leefstijl
& Leren

Gym 2 Learn



• What is the influence of daily gym class on cognitive performance and academic achievement?

Dependent variables:

- SDMT
- IQ
- 2 back task
- Self-esteem
- Motivation
- Mood
- Academic achievement
- Visual perception (Eye-tracking)

Covariates:

- SES
- Pubertal stage
- Alcohol
- Smoking
- Weight
- Height
- Sex

Methods

- 60 students 14-15 years, vocational training
- Waiting list control design
- Baseline, 15 weeks intervention, reassess effect, 15 weeks intervention (4 measurements)

Current stage

- First data collection in progress