Neural correlates of phonological awareness and beginning literacy.

Published: 29-10-2007 Last updated: 20-05-2024

To gain insight in the neural mechanisms underlying of the development of literacy.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON30429

Source ToetsingOnline

Brief title Neural correlates of phonological awareness and beginning literacy.

Condition

• Other condition

Synonym

n.v.t.

Health condition

leesontwikkelingsstoornissen

Research involving

Human

Sponsors and support

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

Intervention

Keyword: Children, ERPs, Phonological Awareness, Reading development

Outcome measures

Primary outcome

Our experimental approach involves the use of three well-established ERP components to tap into different levels of phonological processing in the brain: 1) Mismatch negativity to explore the development of phonological representations, 2) ERP auditory rhyming effect to investigate early stages of phonological awareness, and 3) the go/nogo N200 effect to track the development of phonological segment recognition.

Secondary outcome

n.v.t.

Study description

Background summary

In the Netherlands, almost nine percent of the children following primary education suffer from a reading disorder. A better scientific understanding of how the brain learns spoken and written language is essential for gaining insight into the causes and effects of reading disorders, so that better programs for diagnosis and treatment can be developed. What are the neural mechanisms mediating the acquisition of listening and reading skills? In spite of a growing consistency on the general layout of the cognitive and neuroanatomical components of the adult language system to date still very little is known about how the brain learns to understand spoken and written language. This research project investigates learning-induced plasticity in phonological representations in the developing brain. We will first identify, and validate neural signatures of phonological processing in preschool children. Then, we apply these neural measures to investigate the relation between the development of phonological awareness and reading skills.

Study objective

To gain insight in the neural mechanisms underlying of the development of literacy.

Study design

The research program is divided into three sessions. First, we will investigate the neural basis of phonological awareness in pre-school children who have not received any formal reading education. By using different tasks in combination with different types of electrophysiological measures, we will be able to distinguish between different levels of phonological processing. Second, we will examine how and to what extent these phonological representations are modified by sound and letter training. Third, we will determine to what extent the neural measures of phonological awareness obtained in pre-school children are predictive of their later progress in learning how to read. Children will participate in all of the sessions, and the same experimental paradigm will be used in all sessions. This way, we will be able to track neural changes in phonological representations following specific training on the one hand, and education and development on the other.

Intervention

One third of the children will receive orthographic training, and one third will receive phonological training. Both training conditions will be implemented in a computer program and compared with a control group, which will be engaged in language unrelated computer games but without a language component. Children assigned to the different training conditions will be carefully matched in terms of performance levels, and developmental profiles. This way, training results will not be confounded by individual differences between children. Training will be administered in 12 sessions of one hour each, spread out over the time course of one month.

Study burden and risks

There are no risks associated with the study. The burden for the children is extremely low. The EEG will be recorded using ActiCap electrode sets. These caps are easy to apply, and especially suited for testing children. EEG measurement will take place in a minivan that is especially designed to test children at the location of their school or home, which minizes the burden even further. Momentarily the bus and all products are successfully used at the Behavioral Science Institute and the F.C. Donders Centre for Cognitive Neuroimaging for EEG recording in school children and children suffering from cerebral palsy. Experimental tasks are designed in such a way that they can be easily carried by the study population to keep the cognitive burden at a minimum. Children can relax and play during frequent breaks.

Contacts

Public Radboud Universiteit Nijmegen

Postbus 9101 6500 HB Nijmegen Nederland **Scientific** Radboud Universiteit Nijmegen

Postbus 9101 6500 HB Nijmegen Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age Children (2-11 years)

Inclusion criteria

Healthy, normal children who are in their second year of kindergarten at the start of the study

Exclusion criteria

- 1) Children with developmental, psychiatric, or neurological disorder(s)
- 2) Children whos first degree familymembers suffer from a reading disorder
- 3) Children whos native language is not Dutch
- 4) Children being able to read at the start of the study
- 5) Children with severe hearing and/or visual impairments

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Prevention

Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	07-10-2008
Enrollment:	60
Туре:	Actual

Ethics review

Approved WMO	
Date:	29-10-2007
Application type:	First submission
Review commission:	CCMO: Centrale Commissie Mensgebonden Onderzoek (Den Haag)

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

ССМО

ID NL12709.000.06