Brain activation during sentence processing in Parkinson's disease: an event related fMRI-study.

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We hypothesise that basal ganglia are involved in sentence processing whenever a sentence structure deviates from the predicted structure and this in order to inhibit the irrelevant structure and to switch to a revision process.

Ethische beoordeling	Niet van toepassing
Status	Werving gestopt
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON27976

Bron
NTR

Verkorte titel
N/A

Aandoening

To test our hypothesis we developed six conditions by crossing two within subject factors in a 2x2x3 factorial design. The first factor is word order with two levels: active and passive. The second factor is grammaticality with three levels: no violation, an inflectional morphology violation, and a transitivity violation condition. On the basis of these six conditions we created a set of materials that will be used in two different experiments. We will first conduct an event related fMRI-experiment and analyze the brain activations during a semantic relatedness task. After this scanning procedure we will also conduct an off-line behavioral experiment to collect accuracy and latency data on the grammaticality judgments.

Ondersteuning

Primaire sponsor: University of Groningen, Faculty of Arts, Neurolinguistics
Overige ondersteuning: Stichting Internationaal Parkinson Fonds
Hoofdweg 667A

2131 BB Hoofddorp

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

For the fMRI analysis data, a main effect of group is expected. The level of activation in the BG will be reduced in the PD patient group compared to the healthy control group. For the within subject factors we expect to find a main effect of grammaticality. In the healthy elderly subject group, we expect that the processing of the grammatical incorrect sentences will activate the BG more compared to the processing of the grammatical correct sentences. For the behaviourally data, we expect to find slower reaction times (RTs) for the processing of non-canonical ungrammatical sentences (i.e. passive sentences with a violation) in both subject groups. However the RTs will be significantly more affected in the PD group compared to the healthy elderly subject group.

Toelichting onderzoek

Achtergrond van het onderzoek

Linguistic research has revealed that some Parkinson’s disease (PD) patients demonstrate difficulties with the comprehension of syntactically complex or rather long sentences. However, it remains unclear whether cognitive limitations such as working memory (WM), attention, and information processing speed (IPS) account for the comprehension difficulties of PD (e.g. Grossman et al., 1992; Grossman et al., 2000; Grossman et al., 2002; Lee et al., 2003); or whether the impaired sentence comprehension is due to a specific grammatical processing deficit (Lieberman et al., 1992; Natsopoulos et al., 1993; Natsopoulos et al., 1991). Up until today, relatively little is known about the involvement of the BG and/or fronto-striatal system in sentence comprehension. PD is one of the disorders of the basal ganglia. In order to evidence the involvement and the function of the BG in linguistic processes, we can study this group of patients while performing language tasks. We hypothesise that whenever the structure of a sentence deviates from the predicted syntactic structure (because of for example and error), the BG are involved in order to inhibit the irrelevant structure and to switch to a revision process.

Objective:

The primary goal of this study is to understand the sentence comprehension difficulties in Dutch speaking PD patients. Secondly, we developed the two experiments to test the hypothesis that the BG are involved and play a particular role in syntactic processing.

Doel van het onderzoek

We hypothesise that basal ganglia are involved in sentence processing whenever a sentence structure deviates from the predicted structure and this in order to inhibit the irrelevant structure and to switch to a revision process.

Onderzoeksopzet

N/A

Onderzoeksproduct en/of interventie

No interventions. It is observational research with the use of FMRI (no use of invasive techniques).

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

1. Idiopathic Parkinson's Disease (PD)

2. Hoehn and Yahr Stage 1 to Stage 3

3. Normal vision and hearing

4. Able to give informed consent

5. Older than 40 years

6. Dutch as first language

7. Right-handed

8. Normal structural MRI scan

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

1. Not optimally medicated

2. Neurostimulator

3. Implanted pump (e.g. apomorphine)

4. Dementia (MMSE-score < 25)

5. Depression (MADRS > 18)

6. Another neurological disease

7. Another akinetic-rigid disorder

8. Another movement disorder

9. No normal structural MRI scan

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders

Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestopt
(Verwachte) startdatum:	01-12-2006
Aantal proefpersonen:	32
Type:	Werkelijke startdatum

Ethische beoordeling

Niet van toepassing

Soort:	Niet van toepassing

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL771
NTR-old	NTR782
Ander register	: N/A
ISRCTN	ISRCTN18548326

Resultaten

Samenvatting resultaten
Presentations on conferences and articles in scientific journals.