# Attentional effects on the processing of noxious brief electric stimuli measured with EEG - Event-Related Potential (ERPs) testing.

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- Measuring attentional effects central processing of somatosensory and noxious, brief electric, stimuli.

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

## Summary

### ID

NL-OMON30353

**Source**
ToetsingOnline

**Brief title**
Attention and nociception

### Condition

- Other condition

**Synonym**
cognitive functioning, nociception

**Health condition**

somato-sensore informatie verwerking

**Research involving**
Human

## Sponsors and support

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

## Intervention

**Keyword:** Attention, Cognition, EEG, Nociception

## Outcome measures

### Primary outcome

The main parameters will be ERP component amplitudes (in µV) and VAS values (on a continuous scale between 0-10). ERP component amplitudes from both visual warning stimuli (N1, P2, N2 and P3, as well as CNV) and noxious stimuli (N140, P260) will be determined. In a previous pilot experiment with healthy volunteers (CMO-nr.: 2005/288) we found marked effects on noxious stimulus predictability on both the CNV preceding the noxious stimuli and the P260 following the noxious stimuli.

### Secondary outcome

Behavioral responses to the attentional task

1. Omissions and Error rates

2. Reaction Times

Test scores to the Thayer scales

ECG: heart rate and heart rate variability

demographic data

# Study description

### Background summary

Pain is an unpleasant sensory experience associated with actual or potential tissue damage, or described in terms of such damage.
There is a difference between the terms nociception and pain; the first refers to the physiological manifestations generated by noxious stimuli, whereas the second involves the unpleasant experience of an aversive stimulus, which requires the cognitive and affective processing of noxious stimuli.
Recently, MRI research has shown that chronic back pain can be associated with decreased prefrontal and thalamic gray matter density. In addition, several studies have reported that (chronic) pain affects cognitive functioning.
Vice versa, a number of studies have demonstrated that cognitive processes can alter nociception.
Thus, we hypothesise that cognitive operations affect the processing of noxious stimuli. Knowing more about cognitive aspects of nociception might lead to a better understanding and treatment of chronic pain. ERP measurements are an excellent method to examine cognitive processes.

### Study objective

- Measuring attentional effects central processing of somatosensory and noxious, brief electric, stimuli.

### Study design

Visual stimuli will be presented followed by brief, electric noxious stimuli. Simultaneously the EEG will be recorded.
The experiment will comprise a S1-S2 paradigm. Each trial contains a S1 as S2 stimulus. Before each trial, a tone (1000 Hz, 100 ms) will be presented together with a visual fixation cross on a computer screen. After 1 second, the S1 will be presented for 400 milliseconds. S1 is a green/red diamond shape with the green site pointing either left or right and the red site pointing either left or right. Depending on the instructions, the participant has to attend to either the red or green site of the diamond. Participants have to attend 50 trials to one colour (session 1) and 50 trials to the other colour (session 2). The order of colours will be counterbalanced over participants.
One second after this visual S1 stimulus, the S2 stimulus will be presented. The S2 stimulus is a brief electric stimulus wit either a high intensity (VAS 7 - 5 pulse; 50%) or a low intensity (1 pulse, 50%). The S2 is presented on the hand of either the attended site (50%) or the unattended site (50%). So each combination (attended/unattended vs high/low intensity) has a probability of 25%. Depending on the instructions, participants have to respond to only the high or low intensity stimuli (counterbalanced over participants) to only the

attended hand.
Time between trials is 8 seconds variable. The duration of the experiment is 20 minutes.

**Study burden and risks**

n.a.

## Contacts

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## Trial sites

### Listed location countries

Netherlands

## Eligibility criteria

**Age**
Adults (18-64 years)
Elderly (65 years and older)

### Inclusion criteria

Between 18-60 years of age.

### Exclusion criteria

Neurologic / psychiatric history
Use of psychoactive substances
Visual/auditory impairment

## Study design

### Design

**Study type:** Observational non invasive

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|---|---|
| Masking: | Open (masking not used) |
| Control: | Uncontrolled |
| Primary purpose: | Other |

### Recruitment

NL

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|---|---|
| Recruitment status: | Pending |
| Start date (anticipated): | 01-01-2007 |
| Enrollment: | 32 |
| Type: | Anticipated |

## Ethics review

Approved WMO

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|---|---|
| Application type: | First submission |
| Review commission: | CMO regio Arnhem-Nijmegen (Nijmegen) |

## 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 | NL15235.091.06 |