# Altered brain dynamics of self-voice perception

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Tones vs. neutral self-voice (EEG experiment 1 in Session 3; Pinheiro et al., 2018): a) no effect of HP on N100 suppression for self- and externally generated tones as we would expect alterations in sensory feedback only with regards to one’s own…

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|---|---|
| **Ethical review** | Approved WMO |
| **Status** | Other |
| **Health condition type** | Schizophrenia and other psychotic disorders |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON23432

**Source**
NTR

**Brief title**
EVOICE

### Condition

- Schizophrenia and other psychotic disorders

**Synonym**
voice hearing

**Health condition**

The participant pool includes healthy individuals who do not hear voices, healthy individuals who hear voices and clinical voice hearers.

**Research involving**
Human

## Sponsors and support

**Primary sponsor:** Maastricht University
**Source(s) of monetary or material Support:** Maastricht University

## Intervention

- Other intervention

**Explanation**

## Outcome measures

**Primary outcome**

EEG measure (N100 suppression effect; measured during both EEG experiments in session 3)

**Secondary outcome**

EEG measures (P200, pre-stimulus alpha power; measured during both EEG experiments in session 3); EEG resting state measures (measured during session 3), Neuroimaging measures (measured during the optional session 4), Clinical and psychometric measures (measured during session 1)

# Study description

**Background summary**

Altered sensory feedback and source misattribution of self-generated speech may lead to auditory verbal hallucinations (AVH) in non-clinical voice hearers as well as psychotic patients. Unlike non-clinical voice hearers, psychotic patients often report hearing derogatory voices, accentuating their attentional bias towards negatively valenced emotions and salience (threat) misattribution. However, it remains unclear whether an interplay of dysfunctional attentional processes/salience misattribution and altered sensory feedback leads to psychotic AVH. This study aims at investigating this interplay in voice hearers and, therefore, constitutes a critical advancement in terms of the understanding of the neuropsychology of AVH. A well-replicated auditory-motor task combined with EEG in two separate experiments (Experiment. 1: speech manipulation and Experiment. 2: emotion and uncertainty manipulations) will be used to elucidate how misattribution of simple (tones) and complex auditory stimuli (neutral changing to emotional self-voices) results from neural changes in sensory feedback and/or attentional processes in voice hearers as a function of hallucination proneness (HP). In addition, sophisticated neuroimaging techniques will be used to examine the changes in the brain regions associated with these processes as a function of HP. This multi-modal study involves four testing sessions conducted on separate days.

Session 1: Screening (neuropsychological assessments and interviews); Session 2: Voice recordings (to be used during session 3); Session 3: EEG (two separate experiments and resting state EEG recording); Session 4 (optional): Neuroimaging (resting state functional magnetic resonance imaging [rsfMRI]], diffusion tensor imaging [DTI] and structural magnetic resonance imaging [sMRI]]). This study does not involve any form of clinical intervention. The study aims to recruit participants under three categories: 1. healthy individuals who do not hear voices, 2. healthy individuals who hear voices, 3. clinical voice-hearers within the age range of 16-40 years.

### Study objective

Tones vs. neutral self-voice (EEG experiment 1 in Session 3; Pinheiro et al., 2018): a) no effect of HP on N100 suppression for self- and externally generated tones as we would expect alterations in sensory feedback only with regards to one's own voice; b) decrease in N100 suppression for self- vs. externally generated self-voice with increase in HP (EEG experiment 1 in Session 3; Pinheiro et al., 2018); Neutral vs. emotional self-voice (EEG experiment 2 in Session 3): c) decrease in N100 suppression for self- vs. externally generated as we move from emotional to neutral self-voice with HP increase due to alterations in sensory feedback in emotional stimuli;

### Study design

This study has 4 time points as mentioned in the summary corresponding to Session 1: Screening (neuropsychological assessments and interviews); Session 2: Voice recordings (to be used during session 3); Session 3: EEG (two separate experiments and resting state EEG recording); Session 4 (optional): Neuroimaging (resting state functional magnetic resonance imaging [rsfMRI]], diffusion tensor imaging [DTI] and structural magnetic resonance imaging [sMRI]]). All sessions will be conducted on separate days.

### Intervention

not applicable

## Contacts

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# Eligibility criteria

**Age**
Adolescents (16-17 years)
Adolescents (16-17 years)
Elderly (65 years and older)
Elderly (65 years and older)

## Inclusion criteria

In order to be eligible to participate in this study, a participant must meet all of the following criteria: General: • Age range: 16-40 years • Written informed consent • MRI compatible (optional) o No metallic implants in the body (e.g., metal braces, metallic teeth filling, pacemaker etc.) o No body tattoos with metallic ink (e.g., colored tattoos may contain metallic ink) o No claustrophobia Group 1: Healthy individuals who do not hear voices This group includes healthy individuals recruited from the general population who vary from low to high HP based on LSHS scores (university students, participant panels, public advertisement). o no reported history or current diagnosis of any neurological or psychological disorder o no use of antipsychotics Group 2: Healthy individuals who hear voices o score on item 8 or 10 of LSHS greater than 0 o score on item 9 should be 0, meaning these individuals are not troubled by the voices o total LSHS score greater than 3 o Item 8: “I often hear a voice speaking my thoughts aloud” o Item 9: “I have been troubled by hearing voices in my head” o Item 10: “In the past, I have had the experience of hearing a person’s voice and then found that no one was there o no use of antipsychotics o no reported history or past or current diagnosis presence of any neurological or psychological disorder Group 3: Clinical voice-hearers This group includes individuals with or without formal diagnosis of psychotic disorder who seek help for their mental health specifically with respect to AVH such as at high-risk for psychosis individuals, psychotic patients with past/present AVH experience. o scores on item 9 and 8 and/or 10 of LSHS greater than 0, meaning not only do they hear voices but are also are troubled by them o total LSHS scores greater than 3 Please note that the categorization of participants is merely for the recruitment purposes and statistical analyses will be based on the continuum perspective. Duration and dosage of any antipsychotic medication and/or other psychotropic drugs will be recorded and used as covariates in the analyses.

## Exclusion criteria

A potential participant who meets any of the following criteria will be excluded from participation in this study: o Any previous neurosurgery or neurological disorder, including epilepsy o Refusing to have EEG performed o Inability to fully comprehend the purpose of the study or to make a rational decision whether or not to participate o If voice hearing is caused

by substance abuse (drug or alcohol addiction) or a neurological condition such as tumor or lesions etc.

# Study design

## Design

| | |
|---|---|
| Study phase: | N/A |
| Study type: | Observational non invasive |
| Intervention model: | Other |
| Allocation: | Non controlled trial |
| Masking: | Open (masking not used) |
| Control: | N/A , unknown |
| Primary purpose: | Basic science |

## Recruitment

NL

| | |
|---|---|
| Recruitment status: | Other |
| Start date (anticipated): | 01-06-2021 |
| Enrollment: | 45 |
| Type: | Actual |

## IPD sharing statement

**Plan to share IPD:** No

# Ethics review

Approved WMO

| | |
|---|---|
| Date: | 12-11-2020 |
| Application type: | First submission |
| Review commission: | METC Academisch Ziekenhuis Maastricht / Universiteit Maastricht<br><br>Postbus 5800<br>6202 AZ Maastricht<br>043 387 6009 |

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# Study registrations

## Followed up by the following (possibly more current) registration

ID: 52913
Bron: ToetsingOnline
Titel:

## Other (possibly less up-to-date) registrations in this register

No registrations found.

## In other registers

| Register | ID |
|---|---|
| NTR-new | NL9508 |
| Other | METC UMC : METC20-035 |
| CCMO | NL72992.068.20 |
| OMON | NL-OMON52913 |

# Study results