# The effect of musical background in normal hearing listeners and cochlear implant users

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Objective: The objective of this study is to identify the effect of musical training on the perception of speech in quiet and in noise, pitch, timbre, and melody recognition and the enjoyment of music in normal hearing listeners using non-processed...

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| **Ethical review** | Approved WMO |
| **Status** | Recruitment stopped |
| **Health condition type** | Hearing disorders |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON37727

**Source**
ToetsingOnline

**Brief title**
MUCI

### Condition

- Hearing disorders

**Synonym**
deafness, Hearing-impairment

**Research involving**
Human

### Sponsors and support

**Primary sponsor:** Universitair Medisch Centrum Groningen
**Source(s) of monetary or material Support:** Ministerie van OC&W

## Intervention

**Keyword:** Cochlear implant, Music perception, Musical background, Speech perception

## Outcome measures

### Primary outcome

Investigate the effect of musical training on the perception of speech in quiet

and in noise, and music perception using pitch, timbre and melody recognition

and enjoyment in normal hearing listeners and cochlear implant users.

The main study parameters are the percent correct scores on each test.

### Secondary outcome

Not applicable

# Study description

### Background summary

Cochlear implants (CIs) are prosthetic devices that restore hearing in profound deafness. Improvements in device design have produced good speech understanding in quiet, but speech perception in noise and enjoyment and perception of music are still not satisfactory. This is a factor that could profoundly affect the quality of life for many CI users, as CI users rank music, after speech perception, as the second most important acoustical stimulus in their lives.

In addition to potential benefits for quality of life, exposure to music or musical training may also pose specific benefits for sound and speech perception. In normal-hearing (NH) listeners, long-term musical experience can change the sound representation in the auditory system. Enhanced subcortical and cortical representation of speech and brainstem encoding of linguistic pitch are observed with musicians. These findings suggest that there may be a shared neural basis for music and language processing. Perhaps as a result of this, long-term musically experienced NH adults understand speech in noise better than non-musicians do. Based on the studies with NH musicians, we have hypothesized that musical background or musical training might help CI recipients to have better hearing performance and/or speech perception than non-musically trained CI recipients.

Our research exploring this hypothesis will provide us a better understanding of the effect of musical training on the performance of CI recipients and might lead to the implementation of musical training in the revalidation program of the CI users and improvements in speech in noise and music perception and enjoyment and quality of life.

### Study objective

Objective: The objective of this study is to identify the effect of musical training on the perception of speech in quiet and in noise, pitch, timbre, and melody recognition and the enjoyment of music in normal hearing listeners using non-processed acoustical stimuli and cochlear implant simulations.

### Study design

Study design: Case-control study. The participants listen to acoustic stimuli and the perception is measured via percent correct scores per test.

### Study burden and risks

There are no known risks or benefits associated with the participation in the experiment. The two sessions last for about 2 hours and adequate breaks are built into the experiment.

## 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

25 musically trained healthy participants (start musical training before the age of 7 and with 10 or more years experience), older than 18, with normal hearing, native Dutch speakers;25 non-musically trained healthy participants (no formal musical training < 7 years ago), older than 18 years of age, with normal hearing, native Dutch speakers;25 musically trained before implantation cochlear implant users, older than 18 years of age, native Dutch speaker ;25 musically trained after implantation cochlear implant users, older than 18 years of age, native Dutch speaker ;25 non-musically trained cochlear implant users, older than 18 years of age, native Dutch speaker

### Exclusion criteria

- A history of neurological and psychiatric disorders
- Other mother language than Dutch
- Hearing impairment (only applicable in normal hearing participants)

## Study design

### Design

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|---|---|
| Study type: | Observational non invasive |
| Intervention model: | Other |
| Allocation: | Non-randomized controlled trial |
| Masking: | Open (masking not used) |
| Control: | Active |
| Primary purpose: | Other |

### Recruitment

NL

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|---|---|
| Recruitment status: | Recruitment stopped |
| Start date (anticipated): | 01-11-2012 |
| Enrollment: | 125 |
| Type: | Actual |

## Ethics review

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| Approved WMO Date: | 25-01-2012 |
| Application type: | First submission |
| Review commission: | METC Universitair Medisch Centrum Groningen (Groningen) |
| Approved WMO Date: | 04-03-2013 |
| Application type: | Amendment |
| Review commission: | METC Universitair Medisch Centrum Groningen (Groningen) |

## 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 | NL38967.042.11 |