

Perception of Indexical Cues in Adults and Children - XL

Published: 27-11-2019

Last updated: 28-04-2024

To investigate the role of talkers* voices in speech communication in NH, HI, and CI children and adult listeners, and how the perception of talker voice information relates to the processing of indexical and linguistic information among these...

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Hearing disorders
Study type	Observational non invasive

Summary

ID

NL-OMON52750

Source

ToetsingOnline

Brief title

PICKA-XL

Condition

- Hearing disorders

Synonym

Cochlear implant, deafness

Research involving

Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen

Source(s) of monetary or material Support: Ministerie van OC&W,NWO VICI;NWO VENI

Intervention

Keyword: cochlear implant, speech perception, voice characteristics

Outcome measures

Primary outcome

The main study parameters are performance measures in non-invasive tests of behavioural, eye-tracking, and EEG methods, and changes in performance due to hearing impairment, hearing device use, and language and developmental background.

Secondary outcome

niet van toepassing

Study description

Background summary

A cochlear implant (CI) is a prosthetic device that partially restores the hearing of profoundly deaf individuals. However, the speech signal that is delivered via the device is spectro-temporally degraded. As a consequence, CI users have difficulties with recognizing and distinguishing the voices of talkers, but the extent of this deficiency is currently not fully known. This limitation may have an impact on speech communication in this population, but the effects of limited voice perception on speech communication have not been investigated. This problem is complex, requiring expertise from a range of fields, such as engineering, linguistics, and medical sciences. We are now in the position to be able to do so, with a systematic approach, thanks to our new NWO VICI (awarded to D. Ba*kent) and VENI (awarded to T.N. Tamati) funding.

The main focus of this research is on the perception of talkers* voices and the role of talkers* voices in speech communication across multiple listener groups. The current study will target the perception of acoustic cues characterizing talkers* voices, including but not limited to fundamental frequency (F0), related to the glottal pulse rate of the vocal chords, and vocal tract length (VTL), related to the size of the talker. These and other voice characteristics are crucial for communication and speech perception. They deliver essential information that can be used to identify a talker*s voice,

extract the actual meaning of words (emotions, sarcasm), adapt to a talker's voice to better understand his/her speech, and segregate speech from noise and other speech streams in noisy environments. Since most speech communication in everyday life involves dealing with multiple talkers in noisy environments, the impaired perception of voice characteristics experienced by CI can considerably and negatively affect their ability to successfully communicate with others.

Earlier research from our research group has provided critical evidence that the perception of acoustic cues related to the perception of talkers' voices, such as F0 and VTL, is impaired in adult CI users (Gaudrain & Ba*kent, 2015; Gaudrain & Ba*kent, in press). This impairment has already been shown to lead to abnormal patterns of vocal gender categorization and emotion recognition compared to normal-hearing (NH) listeners (Fuller et. al, 2014; Gilbers et al., 2015). A new study in our lab is currently investigating these limitations in children (METc NL59930.042.16, Perception of Indexical Cues in Adults and Children). The current larger study will extend these preliminary studies by investigating the perception of talkers' voices in children and adults with normal hearing, hearing impairment (HI), with or without CIs. In particular, we will further investigate the perception of talkers' voices (and voice-related acoustic cues), and its relation with the perception of other speech-related indexical information (e.g., talker identity, gender, accents) and the perception, understanding, and robust learning of linguistic information (e.g., sounds, words, sentences).

Study objective

To investigate the role of talkers' voices in speech communication in NH, HI, and CI children and adult listeners, and how the perception of talker voice information relates to the processing of indexical and linguistic information among these individuals.

Study design

The study consists of questionnaires concerning the language, hearing, and demographic status of participants, and a cross-sectional observational study that consists of behavioural experiments, eye-tracking, and EEG experiments on the perception of voice cues, speech perception and linguistic processing.

Study burden and risks

There are no known risks or benefits associated with participation. All tests are non-invasive and consist of simple tasks, such as listening to a recorded sound or speech sample, and making a judgment about the voice or meaning of this sample. The total duration will be broken into multiple sessions on multiple days to minimize fatigue and maximize alertness. Session duration and the number of sessions will be adjusted for each participant as needed. To

further reduce potential fatigue, adequate breaks will be built into the experiment and will also be given on request of the participant.

Contacts

Public

Universitair Medisch Centrum Groningen

Hanzeplein 1
Groningen 9713 GZ
NL

Scientific

Universitair Medisch Centrum Groningen

Hanzeplein 1
Groningen 9713 GZ
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adolescents (12-15 years)
Adolescents (16-17 years)
Adults (18-64 years)
Children (2-11 years)
Elderly (65 years and older)
Babies and toddlers (28 days-23 months)

Inclusion criteria

General inclusion criteria

- Native Dutch speakers
- Non-native or bilingual speakers of Dutch with good proficiency in Dutch language

NH, HI, and CI children:

- Aged from 10 months up to 18 years

NH children:

- Normal hearing

- No developmental disorders and/or cognitive problems

HI children:

- Hearing impairment

- No developmental disorders and/or cognitive problems

CI children:

- More than one year of CI experience

- No developmental disorders and/or cognitive problems

- No other health conditions (comorbidity)

NH, HI, and CI adults

- Aged 18 years or older

NH adults:

- Normal hearing

- No developmental disorders and/or cognitive problems (that may impede testing)

HI adults:

- Hearing impairment

- No developmental disorders and/or cognitive problems (that may impede testing)

CI adults:

- More than one year of CI experience

- No developmental disorders and/or cognitive problems (that may impede testing)

- No other health conditions (comorbidity)

Exclusion criteria

General exclusion criteria:

- Not able to complete the experiment

Exclusion criteria NH children and adults:

- Hearing loss

Study design

Design

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	
Recruitment status:	Recruiting
Start date (anticipated):	03-12-2019
Enrollment:	2870
Type:	Actual

Ethics review

Approved WMO	
Date:	27-11-2019
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO	
Date:	14-01-2020
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO	
Date:	06-10-2020
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO	
Date:	05-10-2021
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO	
Date:	29-06-2022
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	NL66549.042.18