Accessibility of TV speech

Participant Information Sheet (PIS)

You are being invited to take part in a research study funded by the National Institute of Health Research Manchester Biomedical Research Centre in Hearing Health. This study is on the accessibility of speech used in television and broadcasting. Before you decide whether to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for taking the time to read this.

About the research

- **Who will conduct the research?**

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- **What is the purpose of the research?**

The problem of unintelligible speech in television and broadcasting ("TV speech") has attracted much media coverage and has been debated in the House of Lords. An ageing demographic means that people with some degree of hearing loss make up an increasing percentage of TV audiences. People over 55 watch more TV on average than any other demographic.

Previous research by the BBC and University of Salford indicate that a number of factors contribute to the comprehensibility of TV speech: clarity of speech delivery, balance between audio elements, background sounds and reproduction equipment. The comprehensibility of auditory content in broadcasting is not the only factor that may influence accessibility: If the cognitive effort required for successful listening ("listening effort") is too great, this may also have a negative impact on listener engagement.

In this study we will build on existing work to quantify not only speech comprehension but also listening effort in older listeners with either "normal hearing" or hearing-impaired listeners who wear their own hearing aids. Previously, the importance of reduced listening effort has been undermined by use of insensitive outcome measures such as the degree of intelligibility, rather than comprehensibility, achieved in speech perception tasks. Notably, there can be large differences in the required listening effort between hearing-impaired listeners, despite similar hearing status and performance in speech intelligibility tests.

We are aiming to recruit older listeners (50-75 years) who are either normal hearing or who have a known hearing loss and use their hearing aids regularly (using the device for more than 2 hours per day). Participants must be native English speakers with no history of neurological or speech disorders and with normal or corrected-to-normal vision.

We are aiming to recruit 118 participants in total, allowing for participant drop out.

- **Will the outcomes of the research be published?**

If the results obtained from this study are published, they will appear in peer-reviewed journal articles. Prior to full publication in journals, portions of the work may be presented at academic conferences.

- **Who has reviewed the research project?**

The research study has been reviewed and approved by the University of Manchester's Research Ethics Committee [UREC reference 2020-8848-13259].

What would my involvement be?

- **What would I be asked to do if I took part?**

The study will require you to undergo testing for up to 1.5 hours. You will be able to take breaks as needed. The tests will consist of:

1) Screening test: Cognitive assessment (5 mins)

Cognition in hearing refers to cognitive processes that are involved in listening to, understanding and remembering sounds. These processes including attention, memory, learning and decision making. The 6CIT (Six-Item Cognitive Impairment Test) will be used to screen for normal cognitive function.

The results of this screening test may affect your eligibility to take part in the rest of the study. If the cognitive screening test does not suggest normal cognitive function, we will recommend that you make an appointment with your General Practitioner and provide you with a letter to take to this appointment. This letter will describe the results of the cognitive screening test.

2) Screening tests: Hearing assessment (35 mins)

2.i.) Otoscopy

Otoscopy is a visual examination used to check for excess wax and/or foreign bodies. During this examination, the researcher will gently place the tip of an otoscope into your ear(s) and shine a light into the ear canal(s). The researcher will then carefully rotate the instrument in different directions to see the inside your ear(s).

If the research audiologist finds excess wax in your ear(s), you will be given the option of wax removal by the research audiologist. Wax removal is entirely optional but the presence of excess wax in your ear(s) will affect your eligibility to take part in the rest of the study. Wax may be able to be removed from the ear canal manually using fine, single-use instruments. Alternatively, wax may need to be removed via irrigation i.e. a fine jet of water will be gently circulated around your ear canal to loosen and remove ear wax.

2.ii.) Tympanometry

Tympanometry is used to assess middle ear and eardrum health and function. During this test, you will be seated comfortably and asked to remain as still as possible (avoiding speaking or swallowing). The researcher will then insert a flexible probe into the opening of your ear(s) and send a low tone into the ear canal(s). This will cause air pressure changes inside your ear(s) during which eardrum movements will be recorded. The health and function of your middle ear and eardrum may affect your eligibility to take part in the rest of the study.

2.iii.) Pure Tone Audiometry

Pure Tone Audiometry is a clinical measure of hearing sensitivity and the results of this test may affect your eligibility to take part in the rest of the study. During this test, you will be asked to sit in a sound-proof room while wearing a pair of headphones to measure your hearing thresholds. Sounds of various frequencies will be presented through the headphones and you will be asked to press a button whenever the sound is heard, regardless of how faint the sound is. You will be asked to respond, i.e. press a button, for as long as you can hear a sound.

You will also undergo bone-conduction audiometry to test for/confirm for the type of hearing loss that is associated with ageing (sensorineural hearing loss). The results of this test may affect your eligibility to take part in the rest of the study. This test is similar to air-conduction audiometry in that you will be presented with sounds and asked to press a button when you hear a sound. However, instead of sounds being delivered via headphones (air-conduction), for bone-conduction audiometry, sounds are delivered by a transducer that sits on the mastoid bone i.e. the bone behind the ear.

The results of the hearing screening tests may affect your eligibility to take part in the rest of the study. If the hearing screening tests do not suggest normal hearing function, we will recommend that you

make an appointment with your General Practitioner and provide you with a letter to take to this appointment. This letter will describe the results of the hearing screening tests.

3) Real Ear Measurements (10 mins)

This part of the study will apply to hearing aid users only. Real Ear Measurements are routinely used in clinical Audiology practice for the purpose of fitting hearing aids so if you are a hearing aid user, you will probably have done this test before.

The research audiologist will perform this test to estimate the degree to which your hearing aids (left and right ears) are boosting the volume of sounds. The research audiologist will insert a fine, flexible probe close into your eardrum and then play a sound through a speaker. You will not need to give any response. The test will be carried out both with and without your hearing aids.

If the Real Ear Measurements test indicates that your hearing aids are not performing properly, this may affect your eligibility to take part in the rest of the study until you have had your hearing aids tested in an audiology clinic.

If this test suggests that your hearing aids are not performing properly, we will recommend that you make an appointment with your Audiologist and provide you with a letter to take to this appointment. This letter will describe the results of the hearing aid test.

4) Speech comprehension and listening effort task (30 mins)

You will be seated in front of a PC and presented with sounds from loudspeakers, located at 30^{o} relative to participants. You will be presented with samples of TV speech at a comfortable volume.

You will be asked to listen to a sample of TV speech and then asked a multiple-choice question to test their comprehension of that sample. You will be asked to provide this response as quickly and accurately as possible.

You will then be asked to provide a rating (0-100%) of "how hard they had to work" (i.e. degree of effortful listening) to understand the speech sample.

You will be asked to provide further ratings based on the reasons why the speech did/did not require effortful listening (clarity, accent, background sounds).

At the end of each trial, you will be allowed to pause the experiment and take breaks if needed.

Hearing-impaired participants will be asked to wear their own hearing aids for the duration of this task.

Research will be conducted at:

Manchester Centre for Audiology and Deafness (ManCAD)
Ellen Wilkinson Building
University of Manchester
Oxford Road
Manchester
M13 9PL

- **Will I be compensated for taking part?**

Participants will be given a small honorarium (£10 per hour, 1.5 hours in total) for their time plus up to £10 in travel expenses i.e. up to £25 in total.

- **What happens if I do not want to take part or if I change my mind?**

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself. However, it will not be possible to remove your data from the project once it has been anonymised and forms part of the dataset. This does not affect your data protection rights. If you decide not to take part, then you do not need to do anything further.

- **Are there any additional considerations that I need to know about before deciding whether I should take part?**

Some of the screening tests are not compatible with social distancing (otoscopy, tympanometry, real ear measurements). UK Audiology professional bodies have created guidance to keep both researchers and participants as safe as possible during these screening tests. We will adhere to this guidance, which includes asking participants to

1) Confirm that they and their household/bubble are well and have no symptoms of COVID-19 and are not self-isolating.
2) Wear a high-quality face mask (Type II R) for the duration of any close proximity work. These facemasks will be provided by the research team. You may continue to wear the Type II R facemask for the remainder of the test session, or change into a face mask of your choice.

Alcohol gel and disinfectant wipes will be available in the testing room.

The testing room has a high-quality ventilation system which is designed to exchange air with the outside of the building, rather than re-circulate air.

During the listening tests, you will be asked to make responses using a button press/mouse/keyboard. All pieces of equipment that come into contact with participants and/or researchers will be sanitised at the end of each test session.

The researchers who will conduct the audiological tests that do not allow for social distancing are fully vaccinated for COVID-19. Researchers will follow best practice hand and respiratory guidance and also use Type II R facemasks for close proximity work.

If you do not want to take public transport to the University campus, we will offer to pay for a taxi.

- **What additional steps will you take to keep me safe while I take part?**

Participants will be collected and escorted to the testing room, respecting social distancing. Please arrive on time for the session (not too early or too late) so that you do not have to wait in busy areas of the building.

Additional data use

The research team may have to provide contact details to NHS Track and Trace, if this becomes necessary.

What if the Government Guidance changes?

If the Government Guidance or UK Audiology Guidance changes and no longer allows face-to-face testing for research purposes, we will have to postpone your scheduled test session.

Data Protection and Confidentiality

- **What information will you collect about me?**

In order to participate in this research project we will need to collect information that could identify you, called "personal identifiable information". Specifically we will need to collect:

- Name
- Contact details

- **Under what legal basis are you collecting this information?**

We are collecting and storing this personal identifiable information in accordance with data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is "a public interest task" and "a process necessary for research purposes".

- **What are my rights in relation to the information you will collect about me?**

You have a number of rights under data protection law regarding your personal information. For example you can request a copy of the information we hold about you.

If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our Privacy Notice for Research (http://documents.manchester.ac.uk/display.aspx?DocID=37095; a written copy is available on request).

- **Will my participation in the study be confidential and my personal identifiable information be protected?**

In accordance with data protection law, The University of Manchester is the Data Controller for this project. This means that we are responsible for making sure your personal information is kept secure, confidential and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be looked after in the following way:

Any information obtained by the participants will remain strictly confidential. Signed consent forms will be stored in a locked cabinet in the researcher's office. All other information and data will be stored pseudo-anonymously, i.e. these data will be unidentifiable by anyone except the researchers. The results of the screening tests will be stored pseudo-anonymously in a locked cabinet. All electronic data will be stored in the University of Manchester Research Data Storage. The electronic files will not include any cue to identify the participants involved in the study. For any future use of the data collected, or if any other researcher were interested in accessing the data for research or teaching purposes, the data will be accessed in anonymous form only. Your consent form and contact details will be retained only for the duration of the study. Once the consent form has been destroyed, after publication or alternatively after 5 years, in line with the University of Manchester retention guidelines, all files will become anonymised.

Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

What if I have a complaint?

The tests involved throughout the study sessions are routinely used in scientific research and we will be testing at sound levels that do not have the potential to be injurious. It is highly unlikely that the participants will be harmed during the process. The following are a list of contacts in the case of any issues/complaints to be addressed:

- **Contact details for complaints**

If you have a complaint that you wish to direct to members of the research team, please contact:

Miss Lorenza Zaira Curetti: lorenzazaira.curetti@postgrad.manchester.ac.uk or 0161 275 0210

Mrs. Melanie Lough: melanie.lough@manchester.ac.uk or 0161 275 0505.

Mrs. Helen Whiston: helen.whiston@manchester.ac.uk or 0161 275 0516.

Dr. Rebecca Millman: rebecca.millman@manchester.ac.uk or 0161 275 3387.

If you wish to make a formal complaint to someone independent of the research team or if you are not satisfied with the response you have gained from the researchers in the first instance then please contact

The Research Governance and Integrity Officer, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester, M13 9PL, by emailing: **research.complaints@manchester.ac.uk** or by telephoning **0161 275 2674**.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the Information Commissioner's Office about complaints relating to your personal identifiable information Tel **0303 123 1113**

Contact Details

If you have any queries about the study or if you are interested in taking part then please contact the researcher(s)**:**

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Tel: 0161 275 0210

Mrs. Melanie Lough: melanie.lough@manchester.ac.uk or 0161 275 0505.

Mrs. Helen Whiston: helen.whiston@manchester.ac.uk or 0161 275 0516.