

Auditory Perception of the Foetus



Participant information sheet

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HDEC reference number: 19197

Thank you very much for your interest in taking part in our studies about foetal music perception. Receiving this participant information sheet and the demographic questionnaire does not mean that you must participate in our studies. Whether or not you will take part is completely up to you and if you decide not to take part, you will not have to justify your decision. The choice whether you take part in the studies or not will also not affect the care you are receiving neither for yourself, nor for your pēpi. If you decide to take part in the studies now, but change your mind later, you can withdraw before, during, and up to 14 days after you had your appointment with us. You will not have to justify your decision at any time.

The participant information sheet will inform you about our studies and is there to help you to decide if you want to take part in the studies or not. It describes why we are interested in foetal music perception, how we will investigate it, and what your participation would include. Furthermore, it tells you about the possible risks and the benefits of your participation. It also explains what will happen to your data after we have collected it.

Please ask us if you have any questions or concerns by using the contact details provided on the top of this sheet and further below (see “Who do I contact if I have any questions or concerns?”). Feel free to discuss the given information with your whānau, friends, and healthcare professionals. We will also go through the information with you on the day of your appointment if you decide to participate and answer any questions you might have.

If you choose to take part in the study, we will ask you to sign the consent forms at the end of the document. You will be given your own copy of both the participant information sheet and demographic questionnaire to take home for your records.

The participant information sheet is eleven pages long. Please make sure you have read and understood all pages. Feel free to contact us if you have any questions.

What is the purpose of the studies?

We are interested in foetal music perception. What allows adults and even infants to discriminate between different musical instruments playing the same note, at the same volume, and for the same amount of time is called musical timbre. We are interested if foetuses are already able to differentiate between musical timbres or if this is something babies learn shortly after they are born. Furthermore, we want to find out if foetuses can discriminate major from minor chords. Major chords are commonly perceived as more harmonic and happier, while minor chords are often described as being disharmonic and sad. Newborns can already differentiate major from minor chords, and we would like to see if this is something we learn during the foetal period or if this ability is acquired after birth.

Who can take part?

Every woman with a singleton pregnancy can sign up for the studies. The experimental sessions will be in the 35th to 36th week of pregnancy. To ensure the safety of the participating mothers-to-be and their babies, we will ask if there have been any complications during pregnancy up to this date. All women with a routine pregnancy and a normally developed foetus can take part in the studies. An experienced qualified and registered diagnostic medical sonographer who has a current annual practicing certificate from the New Zealand Medical Radiation Technologists Board in Wellington will check age-appropriate development of the foetus before the start of the experiments.

Where will the studies take place?

All studies will take place in one of the sonography rooms at the Women's Health Clinic, Level 1 Elizabeth Rothwell Building, Waikato Hospital. If you decide to participate, you will be given a map and instructions where to park and how to get to the meeting point outside of the hospital. One of our team members will meet you there and will bring you to the sonography unit where we do the experiments.

What will my participation in the studies include?

If you choose to take part in our studies, you will be asked to answer the questions on a demographic questionnaire which will be given to you closer to the time of your appointment. You will also have one experimental session at Waikato Hospital which includes a briefing at the beginning where one of our team members will go through the participant information sheet with you and will answer all your questions or concerns you may have. Afterwards, you will be

asked to enter the sonography room where everyone of our team present will be introduced to you. A qualified and experienced sonographer will then perform routine foetal check-ups which are very similar to the ones during your previous scans to make sure your pēpi is developed age-appropriately. This is done for your and your pēpi's safety and gives us the chance to see if smaller and bigger fetuses respond differently to our stimuli. You will be asked to partly disrobe your belly for this.

We will then have two experiments with a short break in between them where you can relax. The first experiment will look at timbre perception, the second one at the discrimination of major and minor chords. All stimuli will be played at safe sound levels by a loudspeaker close to your belly. Examples will be played to you before the start of the experiments, and you will be given earmuffs for the time we are playing the sounds to your pēpi. At the end, you will have time to ask questions or comment about what you have seen or heard during the session. We will further try to get some nice pictures of your pēpi on the ultrasound screen, and you will be given vouchers to show our appreciation for your help with our studies. The session will take approximately 45-60 minutes.

We will access some information of your and your pēpi's health notes after you have given birth for example, to find out how big your pēpi was at birth, if it is a girl or a boy, and if there were any complications during pregnancy or delivery. The information will be included in our analyses to see if they influence our results. We will not access any information which is not relevant for the purpose of our studies.

You can also get included in the University of Waikato - Infant Research Group database with the opportunity to take part in further infant and child research in the future. The University of Waikato - Infant Research Group runs experiments to find out more about human development during the newborn period, infancy, and early childhood. Registration for the University of Waikato - Infant Research Group database is voluntary and not required for participation in the present studies. If you are interested, you can sign up for it on the consent form for prenatal data.

Can I withdraw my participation?

If you decide to take part in our studies, your participation will be on a voluntary basis which means that you can withdraw at any time before, during, and up to 14 days after your appointment with us. If you wish to do so, you will not have to justify your decision, and the care provided for you and your pēpi will be the same as before. In case you decide to withdraw, we will destroy all the data you have provided to this point, and we will not use it for our analyses. You will further be informed in writing about the deletion of your and your pēpi's data.

Is there anything I need to be aware of if I take part in the studies?

There are no risks associated with study participation, neither for you, nor for your pēpi.

The volume and the frequency of our sounds follow previous recommendations and are considered safe for your pēpi's ears.

If something unexpected is found during the foetal check-ups at the beginning, our studies will be stopped immediately, and the sonographer will follow the normal procedures of the hospital to get you and your pēpi the help you need. The sonographer will explain the finding to you, your lead maternity carer will be informed, and you may be referred to the appropriate clinical team if that is necessary.

Please be aware that ultrasound will only be used for the present research purpose and not for clinical assessment or personal entertainment.

Are there any benefits for me if I decide to participate?

To show our appreciation for your participation and to account for your travel costs, you will be given \$ 30 vouchers as a small koha. Knowledge is taonga, therefore, you will be given a copy of the participant information sheet, the demographic questionnaire, and debrief form to take home with you to your whānau and friends. We will give our best to answer your questions about our study and related prenatal research to your satisfaction. If you want to know the results of the studies, you can ask to be sent a short summary of the main research findings after the data has been analysed and interpreted.

What if something goes wrong?

You would be entitled to apply for compensation from ACC if you were injured in an accident on your way or during study participation just as you would be if you were injured in an accident at home, at work, or on the road. You would have to make a claim with ACC, and this claim does not automatically have to be accepted, but if it does, you would be supported in your recovery.

If you have private health or life insurance, you may wish to contact your insurer and ask if participation in the study affects your cover.

What will happen to my and my pēpi's data?

Identifiable data. Any data which has identifiable information on it, such as your name, address, or date of birth, is identifiable data. This is the case for the participant information sheet and the demographic questionnaire. Our copies of this data will be securely stored in a locked file cabinet within Te Kura Whatu Oho Mauri, School of Psychology on Hamilton campus of the University of Waikato. Only members of our research team will have access to them.

De-identified data. We will further record your experimental session for later analyses. This data will be de-identified as you will be assigned a random code which is not related to your personal information, such as your name, address, or date of birth. This code will make sure that your and your pēpi's identity is protected and not accessible for anybody outside of our research team. We will keep a record of the code you will be given to be able to identify your coded data if needed, e. g. in case you decide to withdraw and ask us to delete this data. The coded data will be saved on two external hard drives which will also be stored in a locked file cabinet within Te Kura Whatu Oho Mauri, School of Psychology on Hamilton campus of the University of Waikato. Furthermore, another copy of this data will be saved on the university server as a second backup file. All digital copies will be password protected and only members of the research team will have access to them.

All data will be stored securely for ten years as described above and will be destroyed afterwards.

Publication of your data. Your data might be published or presented at a conference etc as part of our study data. If so, your identity will be protected, and only de-identified information will be shared. Nobody will be able to identify you or your pēpi through this.

Right to access your data. You have the right to access your and your pēpi's study data at any time by informing one member of our research team that you would like to do so. You have also the right to get any of your personal information corrected if you disagree with it.

Right to withdraw your data. You have the right to request your data to be deleted if you decide to withdraw your consent for participation. You can do this any time before, during, and up to 14 days after your appointment with us. Any data we would have collected from you and your pēpi to this point would be deleted if you send a written request to one of our team members. We would also stop collecting any more data from you after you have let us know about your decision to withdraw. You might be asked if we can use some of your data for further analyses, but this would be discussed with you individually at the time.

Feel free to contact us any time if you have questions or concerns about how we deal with your or your pēpi's data. Our contact details are listed below (see "Who do I contact if I have any questions or concerns?").

Will I be informed about the results of the studies?

If you want to be informed about the results of the studies, you can request a summary of the main findings when you are giving written informed consent. You will be asked to give us your

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Email or postal address to send you the summary once we have completed all data analyses. This will presumably be between the middle and the end of 2025.

Who is paying for these studies?

The studies are funded by the University of Waikato.

Are the studies approved?

The studies have been approved by the Health and Disability Ethics Committee (HDEC) which is an independent, nationwide acting group of experts which make sure that studies meet ethical standards. The present studies are registered under the following HDEC reference number: 19197.

Who do I contact if I have any questions or concerns?

You can contact Prof. Vincent Reid, the lead investigator of the studies, at any time if you have any questions or concerns about the studies.

Prof. Vincent M. Reid
Head of School
School of Psychology, University of Waikato
Phone: +64 7 837 9593
Email: vreid@students.waikato.ac.nz

You can also contact someone who is not involved in the studies. Below are the contact details to talk to an independent health and disability advocate.

Website: <https://www.advocacy.org.nz/>
Phone: 0800 555 050
Email: advocacy@advocacy.org.nz
Fax: 0800 2 SUPPORT (0800 2787 7678)

If you wish to get Māori cultural support, please talk to your whānau in the first instance. Throughout the duration of the studies, Te Puna Oranga Māori Health Services are also available for Māori support. You can contact a member of Te Puna Oranga at Waikato Hospital.

Te Puna Oranga Māori Health Services
Phone: 07 834 3644
Extension: 97844

You can also call or email the HDEC directly.

Phone: 0800 4 ETHIC

Email: hdecs@health.govt.nz

Cultural consideration

We, the researchers, realise that Māori may have cultural considerations about taking part in our studies. We therefore encourage our participants to discuss the studies with whānau or with other trusted members of the community/ iwi. The collected data will be treated with respect and only used for the purpose of our studies as we acknowledge that the knowledge and experiences shared by our participants are taonga. We also respect the importance of tikanga and encourage our participants to have whānau support present at all times.

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Consent form – prenatal data

Please tick the boxes to give your consent to the following.

I have read, have had somebody read the information on the participant information sheet to me, or have had somebody explained the information to me in my first language.

I have understood the information on the participant information sheet.

I have been given sufficient time to decide if I want to participate in the studies or not.

I am satisfied with the explanations and the answers to my questions about the studies.

I understand that taking part in the studies is voluntary (my choice) and that I may withdraw from the studies anytime without any negative consequences for the medical care of me and my pēpi.

I consent to the research staff collecting and processing my and my pēpi's information, including information about our health.

If I decide to withdraw from the study, I agree that the information collected about me up to the point when I withdraw may continue to be processed.

Yes

No

I consent that my lead maternal carer or general practitioner can be informed about my participation in the studies and of any significant incidental findings obtained during the studies.

I agree to an approved auditor appointed by the New Zealand Health and Disability Ethics Committee, any relevant regulatory

authority, or their approved representative reviewing my relevant medical records for the sole purpose of checking the accuracy of the information recorded for the studies.

I understand the compensation provisions in case of injury during the studies.

I understand that my participation in the studies is confidential and that no information, which could identify me or my pēpi as individuals, will be used in any reports of the studies.

I know who to contact if I have any questions about the studies.

I understand my responsibilities as a study participant.

I have been given a copy of the participant information sheet and the consent form.

I wish to receive a summary of the results from the study.

In case you do, please provide an Email **or** postal address below.

Yes No

Email **or** postal address:

I wish to sign up to the University of Waikato - Infant Research Group database. By providing my contact details I may be contacted by researchers from the University of Waikato with opportunities to take part in further infant and child research.

Yes No

In case you do, please provide your contact details below (Email address **and** phone number).

Email address:

Phone number:

Declaration by participant

I hereby consent to participate in the studies.

Participant's name:

Date:

Signature:

Declaration by member of research team

I hereby declare to have given a verbal explanation of the studies to the participant, and that I have answered the participant's questions to her satisfaction. I further believe that the participant understands the studies and has understood that participation is on a voluntary basis. I also confirm that the participant has given written informed consent to take part in the studies.

Researcher's name:

Date:

Signature:

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Consent form – postnatal data

Declaration by participant

I hereby consent to the research staff collecting and processing my and my pēpi's information about our health after birth. These include, but are not limited to my pēpi's birth measurements, my pēpi's sex, if there were any complications during pregnancy or delivery, and the results of my pēpi's first hearing test.

I understand that only information related to the purpose of the present studies will be accessed.

Participant's name:

Date:

Signature:

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Demographic questionnaire

Please answer the questions below. Do not hesitate to ask the research team in case you have any questions or need help.

Thank you very much for your time.

When were you born (dd/mm/yyyy)?:

Which ethnic group or groups do you belong to?

Please mark any which apply to you.

- New Zealand European
- Māori
- Samoan
- Cook Island Māori
- Tongan
- Niuean
- Chinese
- Indian
- Other (such as Dutch, Japanese, Tokelauan, please specify).

I prefer not to answer.

How many weeks are you pregnant?

When is your expected due date?

Are there any hearing issues in your family or in the family of your pēpi's father?

Yes (please specify)

No

I do not know.

Do you play or have played an instrument, sing or have sung in a choir/ on a regular basis at home, or would you describe yourself as a (professional) musician?

Yes (please specify + how often)

No

Does anyone in your household (e. g. your partner) play or have played an instrument, sing or have sung in a choir/ on a regular basis at home, or would you describe that person as a (professional) musician?

Yes (please specify + how often)

No

I do not know.

Has your pēpi been listening to music on the radio/ the TV/ mobile phone during pregnancy?

Yes (please specify how many hours on an average day)

No

I do not know.

Has your pēpi been exposed to music of any kind but from the radio/ TV/ mobile phone (e. g. choir, band, concert) during pregnancy?

Yes (please specify + how often)

No

I do not know.

Have you used any kind of devices to play music to your pēpi during pregnancy (e. g. loudspeaker placed in front of your belly)?

Yes (please specify + how often)

No

I do not know.

Have you noticed any reactions from your pēpi to music, such as more/ less foetal movements?

Yes (please specify)

No

I do not know

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Has your pēpi been listening to loud noises on a regular basis, such as through a construction site close to your home?

Yes (please specify + how often)

No

I do not know.

Have you noticed any reactions from your pēpi to loud noises, such as more/ less foetal movements?

Yes (please specify)

No

I do not know

Have you smoked, drunk alcohol, or taken any drugs during pregnancy?

Yes (please specify + how often)

We are asking because there is evidence that nicotine, alcohol, and drugs influence foetal hearing and general development. We would like to consider this for our analyses.

No

I prefer not to answer.

To be filled out by the researcher

Date & time

De-identification code

Notes

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Debrief form

Thank you very much for taking part in our studies. Your participation will help us to find out how fetuses percept and discriminate different musical sounds. We will also learn more about how and when music perception develops.

You have taken part in two studies. The first investigates how fetuses respond to different musical instruments and if they can hear a difference between them when they are playing the same note, at the same volume, for the same amount of time. This ability is based on the musical timbre associated with every instrument and previous research has shown that newborns can already discriminate between them. For example, newborns can remember a timbre they had heard during pregnancy, and they show differentiating responses to different timbres which tells us that they can discriminate between them.

The second study is interested in foetal chord perception and tries to answer the question whether the discrimination of major vs. minor chords is already present during the foetal period or if this ability is acquired shortly after birth. As with musical timbre, newborns can discriminate between major vs. minor chords through showing differentiating responses.

Your pēpi has heard different instruments, and a variety of major and minor chords. To make sure that every foetus hears our stimuli at a similar volume, we had to measure the thickness of the different layers of skin, muscle etc. between our loudspeaker and your pēpi's ears, and we had to find out in which position your pēpi was to place our loudspeaker above your pēpi's head. Knowing these things and adjusting the experimental set-up respectively helps us to make the sessions between different participants comparable.

Understanding how music perception develops during gestation and knowing if fetuses can already differentiate between musical timbres and major from minor chords will tell us how our environment influences foetal development and learning in general. Knowing what is normal can also help identify fetuses which are not developing like others, and this can aid clinicians in getting them the help they need.

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Below are some recommendations if you have any further interest in pregnancy, foetal, and early development in general.

- “Mayo Clinic Guide to a Healthy Pregnancy: 2nd Edition: Fully Revised and Updated” by Dr. Myra J. Wick M.D. Ph.D.
- Reid, V. M., & Dunn, K. (2021). The fetal origins of human psychological development. *Current Directions in Psychological Science*, 30(2), 144-150. <https://doi.org/10.1177/0963721420984419a>
- “What's going on in there? How the brain and mind develop in the first five years of life.” By Lise Eliot

Please feel free to contact us if you have any further questions about our research or the results of the studies. The contact details from our lead investigator as well as from the PhD researcher you will have met are listed below. Please do not hesitate to email or call. Once again, thank you very much for your time and for taking part in our research.

Professor Vincent Reid Head of School Email: vreid@waikato.ac.nz Phone: +64 7 837 9593 Address: Te Kura Whatu Oho Mauri, School of Psychology, University of Waikato Gate 1, Knighton Road Hamilton 3240	Leonie Loehn PhD student Email: l472@students.waikato.ac.nz Address: Te Kura Whatu Oho Mauri, School of Psychology, University of Waikato Gate 1, Knighton Road Hamilton 3240
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