

Questionnaires used in Robot Consequential Sounds Research Project

I. PRE-QUESTIONNAIRE

A. Robot Familiarity

Q3.2 Have you ever **watched a movie, television series or YouTube video** that includes robots?

- 0 shows
- 1–5 shows
- 6–10 shows
- 11–50 shows
- 51–100 shows
- More than 100 shows

Q3.3 Have you ever **interacted with** any of these types of robots? (please select all that apply)

- Museum or theme park animatronics
- Toys such as Furby or Cosmo
- Robot vacuum
- Classroom, STEAM or hobby robots
- Battlebots
- Research or industry robots
- Other (please specify below)

Q3.5 Have you ever **controlled a robot**? (please select all that apply)

- Teleoperation or remote control
- Speech/Gesture Commands
- Computer programmed by dragging blocks of code e.g. Scratch, Blockly
- Computer programmed using text e.g. Python, C++
- Other (please specify below)

Q3.7 Have you ever **built a robot**? (please select all that apply)

- Classroom or toy robots (including Lego)
- Hobby or robotics club robots
- Research or industry robots
- Other (please specify below)

Q3.9 Please indicate on this scale, how **frequently you experience robots in your life**? This can include viewing shows of robots or interacting with, controlling, or building robots.

- Daily
- Weekly
- Monthly
- Less Frequently
- Almost Never

Q3.10 Please indicate how well you agree with each of these statements: from **Strongly disagree (1)** to **Strongly agree (7)**

[Note: Likert scales condensed here for brevity]

- 1) I like robots.
- 2) I think robots are trustworthy.
- 3) I think robots are friendly.

4) I think robots are scary.

5) Being around robots or interacting with them makes me feel anxious.

6) I feel comfortable being around robots.

7) Robots are machines/tools and I have no feelings towards them.

Q3.11 I would **like to have robot/s in**: (please select all that apply)

- my home
- the workplace
- public venues

B. Demographics

Q4.2 I am in the **age group**:

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 or older

Q4.3 I identify with the **gender**:

- Female
- Male
- Non-binary/diverse
- Prefer not to say
- My gender identity isn't listed (you may optionally specify your gender below)

Q4.5 I consider myself to be more of an:

- **Introvert**
- **Extravert**

Q4.6 My highest level of **completed education** is:

- Primary School
- Some Secondary School (Highschool)
- Completed Secondary School (Highschool)
- TAFE/apprenticeship/industry training
- Bachelors
- Graduate Certificate
- Masters or Equivalent
- PhD or equivalent
- Other (please specify below)
- Prefer not to say

Q4.8 When considering **modern IT technologies such as computers**, I consider myself to be:

- Beginner/novice
- Intermediate/fairly comfortable with technology
- An expert/professional in one area of technology
- Advanced in most/many areas of technology

II. SOUND CALIBRATION TESTS

Before starting the experiment, we need to do **two quick calibration trials** to check your audio-video setup. These will take less than 2-minutes in total. Please plug in your speakers or headphones and set them to a typical listening volume for you.

A. Test 1

Please play each of the following 2 second long sound-clips, and then answer what you heard. As you listen to the audio-clips, adjust your sound volume such that you can comfortably hear at least one of the three sounds. Feel free to relisten to the sounds and change your answers as you do this. Once you have selected an option for each sound, please continue to the next page.

What did you hear?

- cat purring
- ‘white noise’ type of sound (static)
- traffic
- bird sounds
- people talking
- other
- there was no sound/I couldn’t hear any sounds

The above question was the same for each of the three test sounds, but with selection options randomly ordered. Sound stimuli were also randomly ordered, however the “no sound” condition was not able to occur first.

B. Test 2

The following is a short interactive audio test so we can calibrate your future answers. Across 30 seconds, you will hear short bursts of notes play. Press the “ENTER” key whenever you hear a new note. Timing between sounds is not regular and some of the sounds are quite hard to hear, so please try to pay attention for the full duration. The calibration will begin as soon as you press the ‘PLAY’ button, so make sure you’re prepared to hit the ENTER key at the right times before playing the audio clip. If you are unhappy with your first calibration test, you may redo the test a second time. To do this, make sure the audio clip is stopped, then drag the clip back to the start, wait approximately 5 seconds, and once you are ready hit the play button to restart it.

III. PER ROBOT QUESTIONNAIRE

[Note: all Likert scales presented here have been condensed for brevity from the original presentation to participants]

Q10.1 Prior to participating in this study, in what ways have you **interacted with this robot (or a similar robot) in the past?** (Please select all that apply)

- watched videos of a similar robot
- been around a similar robot in-person
- have a similar robot at home
- worked with a similar robot
- programmed a similar robot
- I have never interacted with a similar robot prior to this study

Q10.2 Whilst watching this video, how much did you **like the robot?** from “Dislike a great deal” (1) to “Like a great deal” (7)

Q10.3 Is there anything specific that you liked/disliked about the robot?

Whilst watching this video, how strongly did the **robot make you feel** the following?:

- Q10.5 Anxious (1) to Relaxed (7)
- Q10.6 Agitated (1) to Calm (7)
- Q10.7 Unsafe (1) to Safe (7)
- Q10.8 Uncomfortable (1) to Comfortable (7)

Q10.9 Imagine yourself in the same physical location as this robot. How much do you anticipate this **robot would distract or interrupt what you are focusing on?**

“completely distracted by robot” (1) to “able to focus as if the robot wasn’t there” (7)

(SOUND CONDITION ONLY) Q11.2 Thinking about the **overall sounds made by the robot**, how much do you agree with the following statements: from ‘Strongly disagree’ (1) to ‘Strongly agree’ (7)

- 1) The robot sounded as I expected it would.
- 2) The sounds were pleasant.
- 3) The sounds were interesting.
- 4) It was fun to listen to these sounds.
- 5) It was boring to listen to these sounds.
- 6) It was confusing to listen to these sounds.
- 7) The sounds made it easy to understand what the robot was doing.
- 8) The sounds made me like the robot more.
- 9) The sounds made me trust the robot more.

(SOUND CONDITION ONLY) Q11.3 If you were able to change the sounds made by this robot, what sounds would you add or remove? What sounds from the video would you like to keep? Briefly describe **how you would want this robot to sound.**

IV. POST-QUESTIONNAIRE

(CONTROL CONDITION ONLY) Q31.2 The video you watched had no sound. Imagine there was sound in the video. Briefly **describe what you think the robot would sound like** if you were in the same room as the robot.

(CONTROL CONDITION ONLY) Q31.3 Imagine the robot can make any sound you want. Briefly describe **how you want this robot to sound**.

Q11.4 How much do you **like each of the following features of this robot**? from ‘Dislike a great deal’ (1) to ‘Like a great deal’ (7)

- 1) **Physical appearance** of the robot
- 2) How the robot moves, the **motions and actions** it takes
- 3) **(SOUND CONDITION ONLY) Sounds** made by the robot

Q12.1 How happy would you be **sharing the following spaces with this robot**? from “I don’t want the robot in this space at all” (1) to “I would enjoy having this robot in this space with me” (7)

- 1) your house
- 2) your place of work
- 3) a public space

Q12.2 What **features of this robot make you happy/unhappy** to be in the same space as this robot? Please mention any particular elements of how it looks, behaves/moves or sounds that make you feel this way?

Q12.3 Please share any other comments you have about this specific video/robot

Q49.2 Thinking back to the 5 videos you watched, please **rank the robots you saw from [1] your favourite to [5] your least favourite** robot?

Q50.1 Why was [robot name] your favourite robot? Please provide a brief description of any specific visual element, movement, sound etc that made this your favourite robot.

Q50.2 Why was [robot name] your LEAST favourite robot? Please provide a brief description of any specific visual element, movement, sound etc that made this your least favourite robot.

(SOUND CONDITION ONLY) Q51.1 Focusing specifically on the sounds the robots made: please **rank the robots again from [1] the robot you most enjoyed the sounds made by to [5] the robot you liked the sounds of least**?

(SOUND CONDITION ONLY) Q52.1 Why did you most like the sounds produced by [robot name]? Perhaps there is a specific sound that makes you feel this way?

(SOUND CONDITION ONLY) Q52.2 Why did you LEAST like the sounds produced by [robot name]? Perhaps there is a specific sound that makes you feel this way?

(SOUND CONDITION ONLY) Q52.3 Consequential sounds are the default sounds a robot is forced to make as it moves and operates. These sounds are what you heard in each of the videos. Overall, **how do you feel about the consequential sounds that robots make**? Please share any thoughts or feelings you have regarding sounds of robots.

Our research team are currently researching ways to improve the consequential sounds of robots. Consequential sounds are the default sounds a robot is forced to make as it moves and operates. Many of your appliances at home make these types of sounds, such as the whir of your washing machine, the hum from your refrigerator, or the gurgle of your kettle.

Q53.2 What sort of **sounds would you personally like robots to make**? Be as creative or specific as you like. You can include different sounds for different robots or scenarios e.g. at home, with friends, reading a book.

Q53.3 Please share with us any other comments which you have on the robots you saw in the videos, their consequential sounds, or this experiment in general.