* Please read carefully the information sheet and the consent form below.

Title of the research project: "How does having a tonal language as a first language affect frequency JND?"

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Objectives: The goal of this study is to analyse how having a tonal language as a first language affects perception of tonal sound.

Methodology and participation: You are going to be presented with 30 short audio files, and asked to mark for each whether the pitch of the second tone in each pair of tones is higher or lower than that of the first. This should take no longer than 10 minutes although you are encouraged to take breaks from if required to avoid audio fatigue.

Risks and benefits: Listening to loud sounds through headphones can pose a risk to your hearing health. Please set your volume responsibly - we have provided volume calibration files to help with this.

Voluntary nature of participation: Your participation in this study is on a voluntary basis and you may withdraw from the study at any time without having to justify why.

Contact information: If you have any question about this study, you may contact any of the investigators via the email addresses provided above.

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* I hereby confirm that I have read the information sheet regarding the research project, I have been able to formulate questions on the project, I have received enough information on the project, and that I am over 16 years old.

I understand that my participation is voluntary and that I can withdraw from or opt out of the study at any time without any need to justify my decision.

○ I give my consent to participate in this study

Q3* Please use a headphone to continue

○ I am using a headphone!

Q1* Please select your age group

○ 0 to 20 years old
○ 21 to 30 years old
○ 31 to 40 years old
○ 41 to 50 years old
○ 51 to 60 years old
○ Over 60 years old

Q2* What is your first language?

[   ]

Q3* What other languages are you fluent in?

[   ]

Q4* Have you ever had, or do you still have, a long-term hobby or profession related to music or sound? (*This could include playing a musical instrument, working as a sound engineer, birdwatching, or anything where music or sound play a central role.*)

○ YES
○ No

Show:

Q4 Have you ever had, or do you still ha... YES Selected

Q5* What hobby or profession related to music or sound do you currently have or used to have?

[ ]

Show:

   Q4 Have you ever had, or do you still ha... YES Selected

Q6*   How long have you been involved in a music or sound-related hobby or profession?

[ ]

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*

You are going to participate in an experiment investigating how different people perceive sound. Please wear headphones and try to ensure that you are somewhere without too much background noise.

You will be presented with 3 pages containing audio files. At the top of each page, you will find an audio file that you can use in order to calibrate your volume. Please listen to this file before answering the questions. Ensure that you can barely hear the quieter tone.

Each audio file will contain 4 pairs of tones. For each pair, we would like you to identify which tone are higher. This process will be repeated 10 times at low, medium, and high frequencies, for a total of 30 audio files.

For example, the demo audio file will contain 8 tones, grouped into 4 pairs. In each pair, one of the tones will have a frequency of 185Hz, and the other will have a frequency of 200Hz. We want you to identify, for each pair, whether the pitch of the second is higher or lower than the pitch of the first. And please choose the one that you think is higher.

This should take no longer than 10 minutes. You can listen to each audio file as many or few times as you like, but be aware of the effects of audio fatigue: after focussing on sounds for too long, you may find your ability to listen closely can diminish.

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* Do you want to watch a introduction video about how to answer the question?

○ YES

○ NO

Show:

   Do you want to watch a introduction vid... YES Selected

* Click to write the question text

[Replace] [Delete]

Welcome to our survey!

Example *Click to write the question text

Here is an example of audio you will hear in Group A. Please put on your headphones and start with a low volume, gradually adjusting it to a comfortable level. For this audio file, the correct options(FFSF) are shown below.

Please select the one you think is higher in each pair

| | First | Second | Equal |

	First	Second	Equal
Pair 1	☑	☐	☐
Pair 2	☑	☐	☐
Pair 3	☐	☑	☐
Pair 4	☑	☐	☐

Replace   Delete

TEST_200-1-185-FFSF.mp3

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* Experiment now starts. Please mark your responses below:

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* Audio 1

Replace   Delete

200-1-192-FFSS.mp3

A1 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

---

* Audio 2

Replace   Delete

200-2-190-FSFF.mp3

A2 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

---

* Audio 3

Replace   Delete

200-3-198-FSSF.mp3

A3 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 4

Replace   Delete

200-4-191-FFFF.mp3

A4 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 5

Replace   Delete

200-5-199-SFSS.mp3

A5 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 6

Replace   Delete

200-6-195-SSFF.mp3

A6 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 7

Replace   Delete

200-7-193-FFSS.mp3

A7 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 8

Replace   Delete

200-8-194-FSFS.mp3

A8 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 9

Replace   Delete

200-9-197-FFSF.mp3

A9 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 10

[Replace] [Delete]

200-10-196-FSFF.mp3

A10 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

Example * Click to write the question text

Please turn down your volume by at least 50% to avoid potential damage caused by volume changes.

Here is an example of audio you will hear in Group B. Please put on your headphones and start with a low volume, gradually adjusting it to a comfortable level. For this audio file, the correct options(FSSF) are shown below.

Please select the one you think is higher in each pair

	First	Second
Pair 1	☑	☐
Pair 2	☐	☑
Pair 3	☐	☑
Pair 4	☑	☐

[Replace] [Delete]

TEST_1000-1-985-FSSF.mp3

* Experiment now starts. Please mark your responses below:

* Audio 1

[Replace] [Delete]

1000-1-995-SFSF.mp3

B1 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 2

[Replace] [Delete]

1000-2-999-SFSF.mp3

B2 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 3

[Replace] [Delete]

1000-3-993-SFFF.mp3

B3 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 4

Replace   Delete

1000-4-996-FSFF.mp3

B4 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 5

Replace   Delete

1000-5-994-SFFS.mp3

B5 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 6

Replace   Delete

1000-6-992-FFSS.mp3

B6 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 7

Replace   Delete

1000-7-990-FSFS.mp3

B7 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 8

[Replace] [Delete]

1000-8-997-FSFS.mp3

B8 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 9

[Replace] [Delete]

1000-9-998-FSSF.mp3

B9 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 10

[Replace] [Delete]

1000-10-991-FSSS.mp3

B10* Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Click to write the question text

Please turn down your volume by at least 50% to avoid potential damage caused by volume changes.

Here is an example of audio you will hear in Group C. Please put on your headphones and start with a low volume, gradually adjusting it to a comfortable level. For this audio file, the correct options(FSSF) are shown below.

Please select the one you think is higher in each pair

	First	Second
Pair 1	☑	☐
Pair 2	☑	☐
Pair 3	☑	☐
Pair 4	☐	☑

[Replace] [Delete]

TEST_5000-1-4900-FFFS.mp3

* Experiment now starts. Please mark your responses below:

* Audio 1

[Replace] [Delete]

5000-1-4940-SSFS.mp3

C1* Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐

Pair 4	☐	☐	☐

* Audio 2

[Replace] [Delete]

5000-2-4964-FSFF.mp3

C2* Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 3

[Replace] [Delete]

5000-3-4976-FFFF.mp3

C3* Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 4

[Replace] [Delete]

5000-4-4952-SFFF.mp3

C4* Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 5

[Replace] [Delete]

5000-5-4970-FFFS.mp3

C5 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 6

[Replace] [Delete]

5000-6-4946-SFFS.mp3

C6 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 7

[Replace] [Delete]

5000-7-4982-SFSS.mp3

C7 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 8

[Replace] [Delete]

5000-8-4988-SFFF.mp3

C8 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 9

[Replace] [Delete]

5000-9-4958-SSSF.mp3

C9 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

* Audio 10

[Replace] [Delete]

5000-10-4994-FFSS.mp3

C10 * Please select the one you think is higher in each pair

	First	Second	Equal
Pair 1	☐	☐	☐
Pair 2	☐	☐	☐
Pair 3	☐	☐	☐
Pair 4	☐	☐	☐

If you are interested in the results of your frequency JND, please leave your email address and we will send the results to you. This is optional, and you can submit without answering.

✱ [   ]

* Thank you for your participation. After submission, you will see two buttons. These are advertisements from the question

naire platform provider. We apologize that we cannot remove them, so please ignore them.