

INFORMATION LETTER

Winterbreath – Collective breathing and music listening during a live concert

Dear participant,

Thank you for your interest in this study. With this letter we would like to invite you to participate in our research project. Before deciding whether to participate, we ask you to carefully read the information below. It explains the purpose of the study, what participation involves, how your data will be handled, and your rights as a participant.

Goal of the project

This study investigates the relationship between music and breathing patterns in collective listening settings. In particular, we examine how rhythmic musical structures may influence breathing dynamics when people listen to music together in a relaxed environment.

During the concert, we aim to measure breathing-related body motion using motion sensors embedded in participants' smartphones. By analysing these signals at group level, we aim to better understand how music may shape collective physiological patterns. The collected data will also be used to create a collective artistic visualization of the breathing patterns of the audience as a form of feedback and appreciation for participation. The project forms part of research conducted at the Institute for Psychoacoustics and Electronic Music (IPEM), Ghent University, focusing on embodied music cognition, collective physiological processes, and art–science interaction.

Why have I been chosen?

You are invited because you are attending the Wintercircus concert in which this study takes place. Participation is open to adult audience members who possess a smartphone (iOS or Android) capable of installing the Comote application. Participation is entirely voluntary and independent of concert attendance.

What does the participation in the study involve?

If you agree to participate, you will be asked to:

Before the concert:

- read this information letter
- read and approve an informed consent form
- install the Comote smartphone application via the App Store or Google Play Store

At the concert:

- bring your smartphone with the Comote app installed
- connect your smartphone to the local Wi-Fi network at the venue
- scan a QR code to connect the app to the study system
- lie down comfortably on a yoga mat
- place your smartphone on your belly–chest area (aligned vertically with the body)
- listen to the live piano performance while breathing naturally

The concert lasts approximately 75 minutes. No specific task or performance is required. We simply ask you to remain as still as reasonably possible to allow measurement of breathing-related motion.

Do I have to participate?

No. Participation is entirely voluntary. Choosing not to participate will not affect your ability to attend the concert in any way. If you decide to participate, you will be asked to provide informed consent. You are free to stop participation at any moment without giving a reason. You can simply remove the smartphone or close the app.

Can I discontinue my participation?

If you wish to discontinue your participation, you can do so without having to give any reason. You will have the opportunity to ask the researcher questions after the study. If you wish, you can always contact researchers Bavo Van Kerrebroeck, Bart Moens, or Pieter-Jan Maes at a later moment in case you have further questions or concerns (see contact details at the end of this document).

What are the possible disadvantages and risks of participation?

We do not expect participation to involve significant risks. The procedure is non-invasive and comparable to resting while listening to music.

Possible minor inconveniences include:

- lying down for approximately 60 minutes
- placing a smartphone on the torso
- installing the mobile application beforehand

You are not asked to change your breathing behaviour. Simply breathe naturally and comfortably. If you experience any discomfort, you may stop participation at any time.

Can I postpone or stop my participation?

If you wish to postpone your participation or stop taking part, you can do so without having to give a reason. You will have the opportunity to ask questions of the researcher after the interview. If you wish, you may also contact the researchers Bavo Van Kerrebroeck (see contact details at the end of this document), Bart Moens, or Prof. Pieter-Jan Maes.

What are the possible benefits of participation?

Participation does not provide direct personal or financial benefit. However, you may find participation meaningful as:

- a contribution to scientific research on music and breathing
- a participation in an innovative art–science concert format
- an opportunity to contribute to a collective artistic visualization based on the audience’s breathing patterns

Participants will receive access to the collective visualization after the study.

Are there any costs associated with participation?

Your participation in the study does not entail any costs for you.

Confidentiality

In accordance with the General Data Protection Regulation and the Belgian law of 30 July 2018 (protection of natural persons with regard to the processing of personal data), we respect your privacy. If the results of the study are published, your identity will remain confidential information. If desired, the Data Protection Officer can provide you with more information about the protection of your personal data (contact details: Ms Hanne Elsen, tel: +32 9 264 95 17 or privacy@ugent.be, Campus Ufo, Rectoraat 2, Sint-Pietersnieuwstraat 25, 9000 Gent). Your personal information (name and email address) will occur only on the

informed consent form, which will be stored on a dedicated and password protected server at the IPEM label, accessible only by administrative personnel and the researchers involved in the study. All other data that will be collected in the study is pseudonymised. This means that all data that could directly identify you (for example your name) will be deleted. All participants receive a unique number instead (which is linked with your personal information on the informed consent form only).

What data will be collected?

The study collects the following types of data:

- Smartphone sensor data: Motion signals from your smartphone (accelerometer, gyroscope, gravity sensors) will be used to estimate breathing-related movement.
- Performance data: Audio and MIDI recordings of the piano performance will be collected in order to synchronize breathing data with musical features.
- Contact details: Your name and email address will only be collected relation to the consent form so that we can document consent and share study results if desired.

What happens to the data?

The informed consent form (containing your email address) will be stored separately from the research data in secure digital format accessible only to the research team. The consent data constitute the only dataset containing directly identifiable information.

All other data collected in this study are pseudonymized and stored in digital format only. These data include smartphone sensor data (accelerometer, gyroscope, gravity), and synchronized musical performance data (audio and MIDI). Data are initially stored on a secure local server during the concert and subsequently transferred to the password-protected and firewall-protected server infrastructure of the Institute for Psychoacoustics and Electronic Music (IPEM), Ghent University. Working copies of pseudonymized data may be stored on password-protected computers of the researchers involved in the project.

Only authorized members of the research team will have access to the data. No identifiable personal data will be shared with third parties.

The results of the study may be disseminated through scientific publications, conference presentations, public lectures, and artistic outputs. All reported results will be fully anonymized and presented only at group level, ensuring that individual participants cannot be identified.

Research data will be stored securely for a period of 5 years after publication, in accordance with Ghent University data management guidelines.

Who has access to my data?

Only the research team at Ghent University (IPEM) has access to the pseudonymized research data. No identifiable personal data will be shared with third parties.

Can I look at the results of the study?

If you wish, you can receive information about the results of the study. This can be indicated on the consent form. Participants will receive access to the collective artistic visualization derived from the group breathing patterns.

Who is organising and funding this study?

This research is conducted by Ghent University, Institute for Psychoacoustics and Electronic Music (IPEM), in collaboration with Wintercircus. The main researcher of this study (Bavo Van Kerrebroeck) is funded by the Fonds voor Wetenschappelijk Onderzoek, grant number 1259426N.

Who approved this study?

This study has been submitted for approval to the Ethics Committee of the Faculty of Arts and Philosophy of Ghent University. Approval by the Ethics Committee does not oblige you to participate.

Contact for further information:

- Dr. Bavo Van Kerrebroeck, Researcher, IPEM, Ghent University, bavo.vankerrebroeck@ugent.be
- Dr. Bart Moens, Researcher and lab coordinator, Ghent University, bart.moens@ugent.be
- Prof. Pieter-Jan Maes (promoter and tutor): pieterjan.maes@ugent.be