

TITLE OF RESEARCH: Music-Evoked Imaginings in a Live Concert Setting

PRINCIPAL INVESTIGATOR: Prof. Elizabeth Margulis

PRINCIPAL INVESTIGATOR'S DEPARTMENT: Music

Key information about the study:

Your informed consent is being sought for research. Participation in the research is voluntary

Purpose:

The research aims to improve understanding of thoughts and imaginings that individuals experience while listening to music in a naturalistic live concert setting. This builds on existing research which suggest that listeners experience a range of imaginings while listening to music, including visual imagery, imagined memories and stories.

Duration:

c. 10 minutes per survey half, c. 20 minutes total

Procedures:

Participants will complete either a handwritten survey or an online survey via mobile devices. The survey will consist of Likert-scale questionnaires, demographic information, and free-response questions.

Risks:

There are no discernible risks associated with this study.

Benefits:

In addition to the contribution of new knowledge, participants will directly benefit by gaining first-hand experience in scientific research. Beyond the mere experience of participating, the debriefing statement after the experiment will explain the purpose of the research, and participants may email the researcher with any questions that they may have.

Alternatives:

You have the alternative to choose not to participate in this research study.

Additional information about the study:

Confidentiality:

All records from this study will be kept confidential. Your responses will be kept private, and we will not include any information that will make it possible to identify you in any report we might publish. Research records will be stored securely in a locked cabinet and/or on password-protected computers. The research team will be the only party that will have access to your data. Results of this study may be used in research, publications, or presentations at scientific meetings. If your individual results are discussed, your identity will be protected by using a study code number rather than your name or other identifying information.

Compensation:

Participants will be compensated with an Amazon voucher worth \$10.

Who to contact with questions:

Any questions you may have about this study may be directed to the graduate researcher, Hannah Wilkie, by sending an email to hw3446@princeton.edu. Further information regarding this study may be obtained from the Principal Investigator, Prof. Elizabeth Margulis, at margulis@princeton.edu.

If you have questions regarding your rights as a research subject, or if problems arise which you do not feel you can discuss with the Investigator, please contact the Institutional Review Board at:

Phone: (609) 258-8543

Email: irb@princeton.edu

Summary:

I understand the information that was presented and that:

- My participation is voluntary.
- Refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.
- I may discontinue participation at any time without penalty or loss of benefits.
- I do not waive any legal rights or release Princeton University or its agents from liability for negligence.

I hereby give my consent to be the subject of the research.

Subject's Signature

Date

Person Obtaining Consent's Signature

Date

PART 1 — PLEASE COMPLETE DURING THE INTERMISSION ONLY

Thinking back on the first half of the concert, how often did you experience each of these types of thought, memory or imagining? Tick all that apply.

	Not at all	A small amount of the time	A moderate amount of the time	Most of the time	All of the time
Fictional story or scene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abstract shapes, colors or patterns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smells, tastes or other sensory sensations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memories of experiences from my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memories from media such as films, TV, or video games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the future or personal plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the building or space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyday stuff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PART 1A: MEMORIES

Select the movement during which you imagined the most vivid memory. If you're not sure of the movement, try and make your best guess.

- | | |
|--|---|
| <input type="radio"/> Beethoven, movement 1 — <i>Allegro con brio</i> . | <input type="radio"/> Hough, movement 1 — <i>Au boulevard</i> . |
| <input type="radio"/> Beethoven, movement 2 — <i>Adagio affettuoso ed appassionato</i> . | <input type="radio"/> Hough, movement 2 — <i>Au parc</i> . |
| <input type="radio"/> Beethoven, movement 3 — <i>Scherzo</i> . | <input type="radio"/> Hough, movement 3 — <i>À l'hôtel</i> . |
| <input type="radio"/> Beethoven, movement 4 — <i>Allegro</i> . | <input type="radio"/> Hough, movement 4 — <i>Au théâtre</i> . |
| | <input type="radio"/> Hough, movement 5 — <i>À l'église</i> . |
| | <input type="radio"/> Hough, movement 6 — <i>Au marché</i> . |

Please describe the memory in as much detail as possible.

To what degree do you think these imaginings were prompted by the music you just heard?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

To what degree did these memories come to mind spontaneously (without special effort)?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

Would you say that the memories you experienced were individual to you?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

PART 1B: FICTIONAL IMAGININGS

Select the movement during which you imagined the most vivid fictional story or scene. If you're not sure of the movement, try and make your best guess.

- | | |
|---|---|
| <input type="radio"/> Beethoven, movement 1 — <i>Allegro con brio</i> . | <input type="radio"/> Hough, movement 1 — <i>Au boulevard</i> . |
| <input type="radio"/> Beethoven, movement 2 — <i>Adagio affetuoso ed appassionato</i> . | <input type="radio"/> Hough, movement 2 — <i>Au parc</i> . |
| <input type="radio"/> Beethoven, movement 3 — <i>Scherzo</i> . | <input type="radio"/> Hough, movement 3 — <i>À l'hôtel</i> . |
| <input type="radio"/> Beethoven, movement 4 — <i>Allegro</i> . | <input type="radio"/> Hough, movement 4 — <i>Au théâtre</i> . |
| | <input type="radio"/> Hough, movement 5 — <i>À l'église</i> . |
| | <input type="radio"/> Hough, movement 6 — <i>Au marché</i> . |

Please describe the story or scene in as much detail as possible.

To what degree do you think these imaginings were prompted by the music you just heard?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

To what degree did these imaginings come to mind spontaneously (without special effort)?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

Would you say that the imaginings you experienced were individual to you?

- ☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

PART 1C: OTHER INFORMATION

If you'd like to add further information, such as another movement that elicited a strong response, please do so here.

Please enter your age. _____

Please select your gender.

☐ Male ☐ Female ☐ Non-Binary ☐ Other ☐ Prefer not to say

Please indicate how frequently you listen to classical music.

☐ Very rarely ☐ Somewhat rarely ☐ Moderately frequently ☐ Frequently ☐ Very frequently

For how many years have you engaged in regular daily practice of a musical instrument (including voice)?

Please indicate the part of the auditorium in which you are seated, using the map below for reference.
You can also draw an X on the map to show your location.

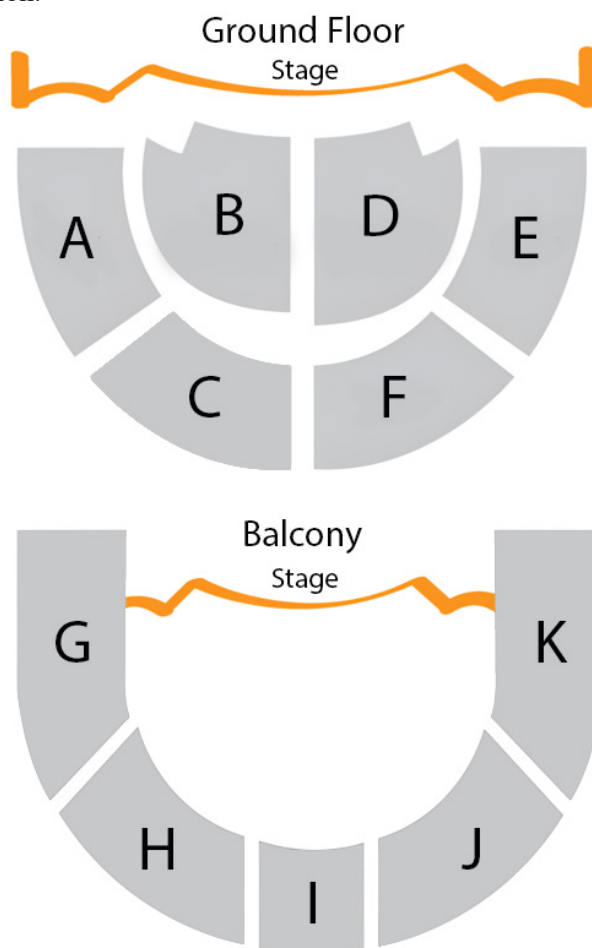
Ground floor:

☐ A ☐ B ☐ C
☐ D ☐ E ☐ F

OR

Balcony:

☐ G ☐ H ☐ I
☐ J ☐ K



STOP!

You have completed Part 1 of the survey.

Please wait until the end of the concert before completing the next part.
When you're ready to take Part 2 at the end of the concert, please continue on the next page.

PART 2 — PLEASE COMPLETE AT THE END OF THE CONCERT ONLY

Thinking back on the second half of the concert, how often did you experience each of these types of thought, memory or imagining? Tick all that apply.

	Not at all	A small amount of the time	A moderate amount of the time	Most of the time	All of the time
Fictional story or scene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abstract shapes, colors or patterns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smells, tastes or other sensory sensations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memories of experiences from my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memories from media such as films, TV, or video games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the future or personal plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts about the building or space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyday stuff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PART 2A: MEMORIES

Select the movement during which you imagined the most vivid memory. If you're not sure of the movement, try and make your best guess.

- ☐ Brahms, movement 1 — *Allegro non troppo*.
- ☐ Brahms, movement 2 — *Andante, un poco adagio*.
- ☐ Brahms, movement 3 — *Scherzo: Allegro*.
- ☐ Brahms, movement 4 — *Finale*.

Please describe the memory in as much detail as possible.

To what degree do you think these memories were prompted by the music you just heard?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

To what degree did these memories come to mind spontaneously (without special effort)?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

Would you say that the memories you experienced were individual to you?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

PART 2B: FICTIONAL IMAGININGS

Select the movement during which you imagined the most vivid fictional story or scene. If you're not sure of the movement, try and make your best guess.

- ☐ Brahms, movement 1 — *Allegro non troppo*.
☐ Brahms, movement 2 — *Andante, un poco adagio*.
☐ Brahms, movement 3 — *Scherzo: Allegro*.
☐ Brahms, movement 4 — *Finale*.

Please describe the story or scene in as much detail as possible.

To what degree do you think these imaginings were prompted by the music you just heard?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

Please rate the degree to which these imaginings came to mind spontaneously.

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

Would you say that the imaginings you experienced were individual to you?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Mostly ☐ Entirely

PART 2C: OTHER INFORMATION

If you'd like to add further information, such as another movement that elicited a strong response, please do so here.

If you would like to receive a \$10 Amazon voucher, please provide your email address below.
This is just so we can send you the voucher; it won't be associated with your data.

Do you have any feedback about the experience of taking the survey?

You have completed the survey, thank you! For a full debrief, please see next page.

Participant Debriefing

Music-Evoked Imaginings in a Live Concert Setting

Thank you for participating in our study!

This experiment aims to understand the range of imaginative processes that occur while listening to live music in a live concert setting. Existing research suggests that music can evoke a wide range of imaginings, including personal memories, fictional stories, and visual imagery. We are investigating if and how people experience these imaginings while listening to live music, in order to learn about how music and the imagination converge in a concert setting.

Selected References:

Jakubowski, K., & Ghosh, A. (2021). Music-evoked autobiographical memories in everyday life. *Psychology of Music*, 49(3), 649–666. <https://doi.org/10.1177/0305735619888803>

Margulis, E. H., & McAuley, J. D. (2022). Using music to probe how perception shapes imagination. *Trends in cognitive sciences*, 26(10), 829-831. [https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00168-1](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00168-1)

Margulis, E. H., Wong, P. C., Turnbull, C., Kubit, B. M., & McAuley, J. D. (2022). Narratives imagined in response to instrumental music reveal culture-bounded intersubjectivity. *Proceedings of the National Academy of Sciences*, 119(4), e2110406119. <https://doi.org/10.1073/pnas.2110406119>

If you have any questions or comments, please do not hesitate to ask us. Thank you again for your participation.

Hannah Wilkie (graduate researcher) hw3446@princeton.edu

Elizabeth Margulis (faculty advisor) margulis@princeton.edu