

Waves of Resonance

The psychological impact of listening to marine sounds from the North Sea and the Arctic

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Elise Guillaume records the sounds of ice melting, Arctic Circle residency for artists & scientists, 2023 © Tamara Susa













"Waves of Resonance" research workshop led by Dr. Marine Severin and Elise Guillaume at the Royal College of Art, London, 2024. © Elise Guillaume & John Janssens



"Waves of Resonance" research workshop led by Dr. Marine Severin and Elise Guillaume at the Flanders Marine Institute, Ostend, 2024. © Elise Guillaume & John Janssen



"Waves of Resonance" research workshop led by Dr. Marine Severin and Elise Guillaume at La Chapelle Jeanne D'Arc Contemporary Art Centre, Thouars, 2025. © Elise Guillaume & John Janssens



"Waves of Resonance" research workshop led by Dr. Marine Severin and Elise Guillaume at La Chapelle Jeanne D'Arc Contemporary Art Centre, Thouars, 2025. © Elise Guillaume & John Janssens

Research questions

1. To what extent does listening to an immersive coastal soundpiece affect well-being and emotions?
2. How do people perceive biological and anthropic sounds?
3. To what extent does the workshop affect ocean literacy? (i.e., connectedness, attitudes, intentions, and behaviors?)
4. What level of knowledge do people have regarding ocean sounds?

=> Use of questionnaires and group discussions

Measures

Pre-survey

- Socio-demographics: age, gender, education level, nationality, subjective health
- Visit frequency to the coast, trait level of nature connectedness
- Ocean-friendly behaviors
- Well-being: stress, mood
- Emotions: basic and complex
- Filler items: attitudes towards music

Post-survey

- Well-being: stress, mood
- Emotions: basic and complex, Awe Experience Scale
- Ocean Connectedness
- Attitudes towards ocean sustainability
- Intentions of ocean-friendly behaviors
- Filler items: feelings of powerlessness, preferences of music styles

A list of initiatives & environmental actions

Environmental actions:

Reduce your plastic footprint

Engage in more sustainable washing (e.g. wash your clothes less often, wash at 30 degrees, swap from washing powder to liquid)

Switch to reusable products (e.g. reusable water bottle, make-up pads, safety razors, produce bags)

Use soap and shampoo bars

Use natural cleaning materials: vinegar, lemons, and water

Buy second-hand clothing or clothing that are long-lasting

Opt for a more plant-based diet or opt for more sustainable seafood

Engage in a beach or river clean-up

Initiatives:

Ocean Decade – GenOcean: <https://oceandecade.org/news/genocean-starts-today/>

The UK-based Marine Conservation Society: <https://www.mcsuk.org/what-you-can-do/citizen-science/>

Natural History Museum: <https://www.nhm.ac.uk/take-part/monitor-and-encourage-nature/community-science.html>

Zooniverse for online-based projects: <https://www.zooniverse.org/>

Citizen programmes for river cleanups: <https://www.thames21.org.uk/>

Measures

Follow-up survey

- Actions towards the shared environmental initiatives
- Frequency of pro-environmental actions
- Ocean-friendly behaviors

Group discussion

Is there a specific sound that affected you ? If so, can you describe the sound and explain how it affected you ?

Were there sounds that you could not distinguish being either anthropic, geophonic or biological ?

Were there any particular sounds wherein you could identify the source?

How did you feel about the anthropic noises?

What do you think of noise pollution and how it affect the ocean?

Ocean Literacy multiple-choice questionnaire

1.Pile driving

Seismic survey
Heartbeat

2.Animal's tail tapping

Fish

Human playing drum

3.Whispers

Wind and waves

Sea ice rubbing and melting

4.Crustacean stridulation

Diver equipment tapping on oxygen bottle
Fish grunt

5.Vessel

Kayak
Pile driving

6.Waves recorded from above and below simultaneously

Waves recorded with a hydrophone
Waves recorded with a geophone

7. Air bubbles escaping from melting glacier ice

Water dripping inside a cave
Melting sea ice

8.Metallic impact

Mermaid

Dolphin whistle

9.Diver speaking underwater

Seal moan

Vessel impact on sea ice

Hypotheses

- RQ1, based on pre/post survey: Listening to the sound piece will increase well-being, awe experience, and ocean connectedness.
- RQ2, based on group discussion, qualitative analysis
- RQ3, based on pre/post/follow-up survey:

H1: Participating in the workshop will increase ocean-friendly behaviors.

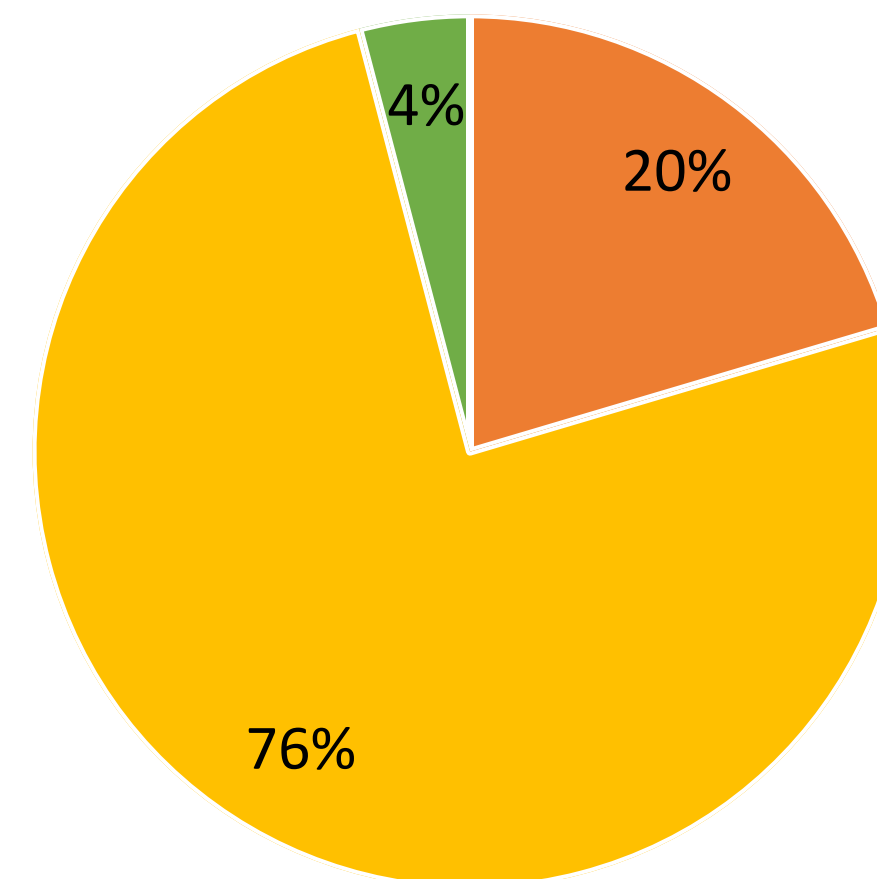
H2: Ocean-friendly attitudes and intentions will predict this positive change in behaviors.

- RQ4, based on answers to the ocean literacy multiple-choice questionnaire

Preliminary results

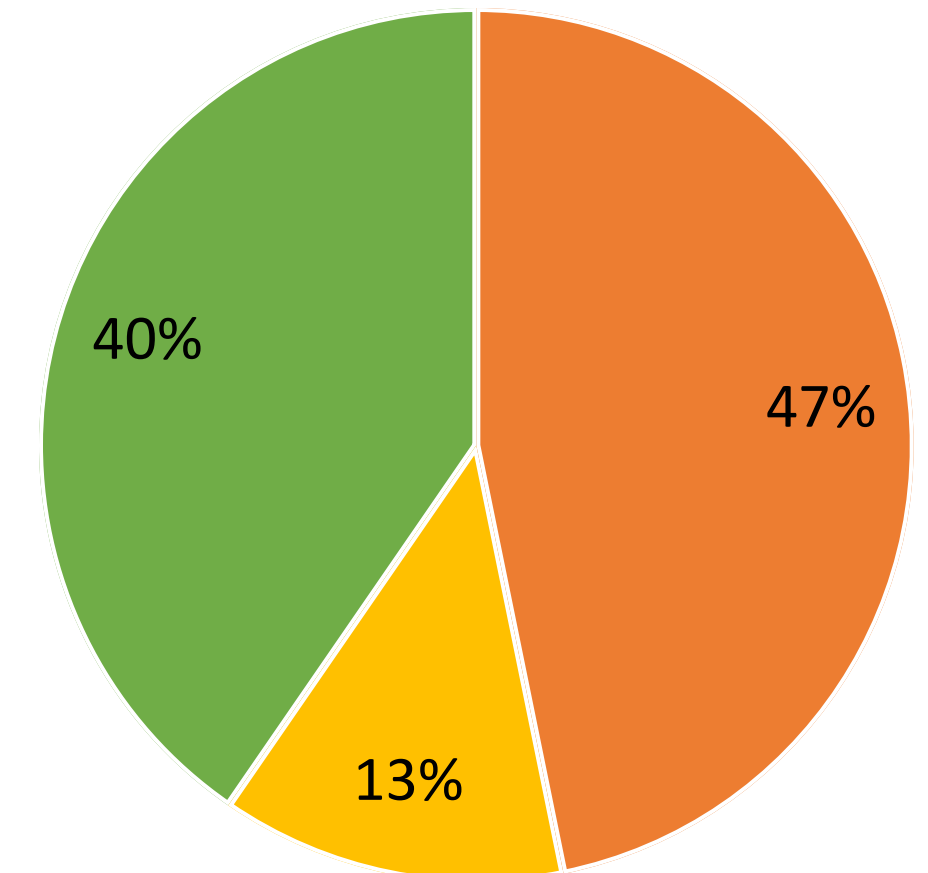
- $N = 50$ participants in total
 - $n = 18$ in London, Royal College of Arts
 - $n = 32$ in Ostend, Day of Science
- 56% female, 38% male, 4% other
- 62% Belgian, 16% Chinese, 8% British

Education level



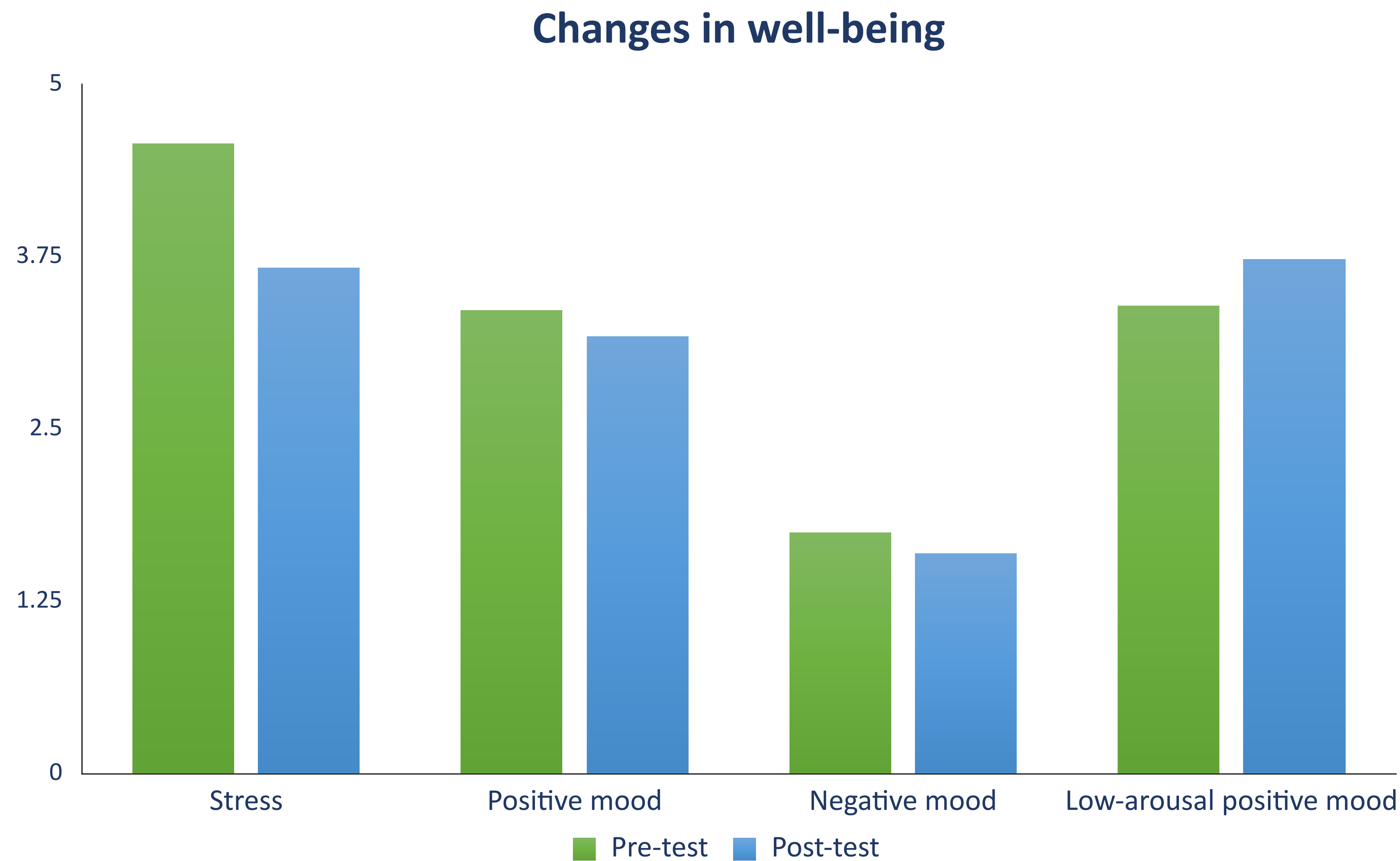
● Secondary school ● Higher education ● PhD

Age

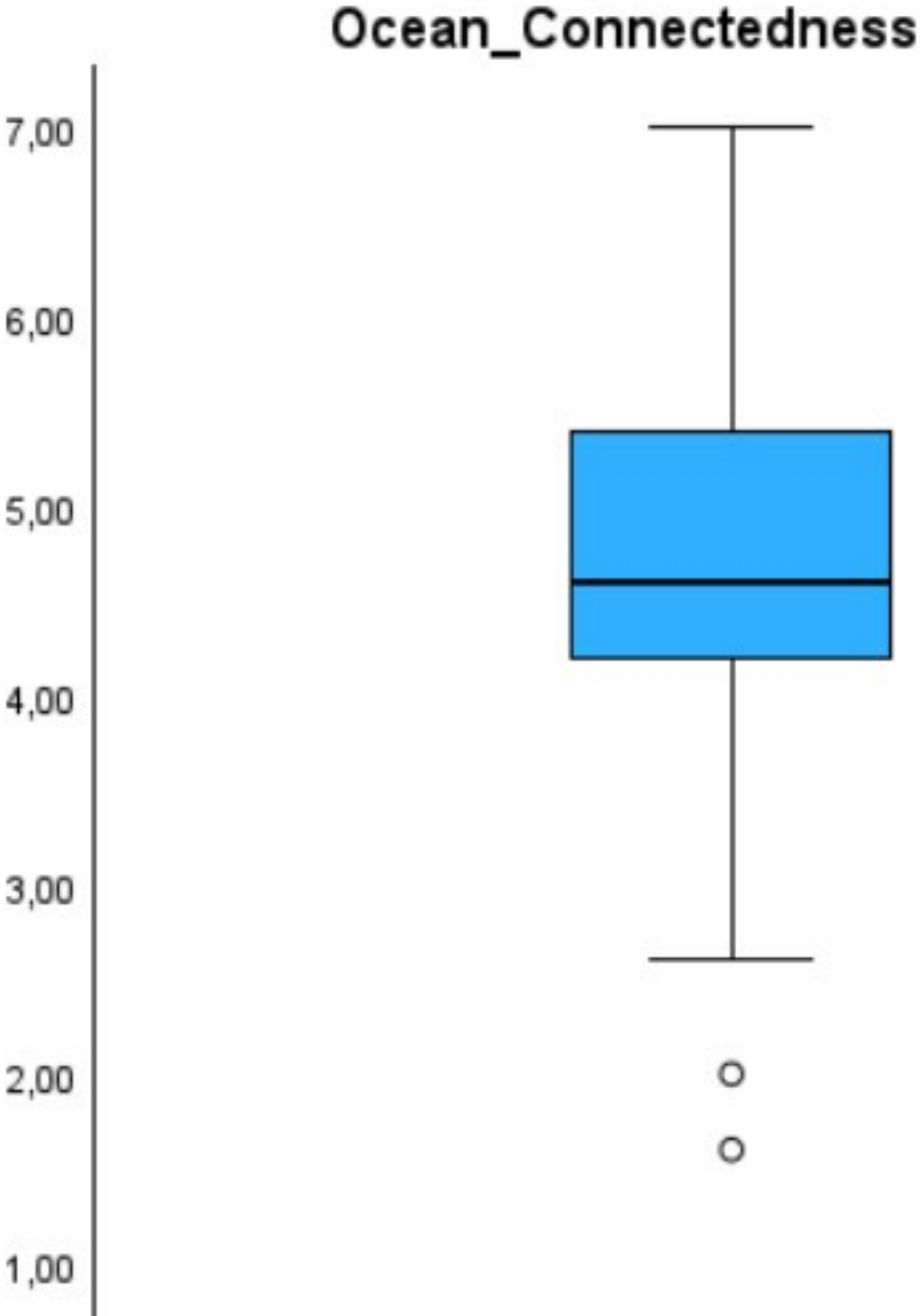
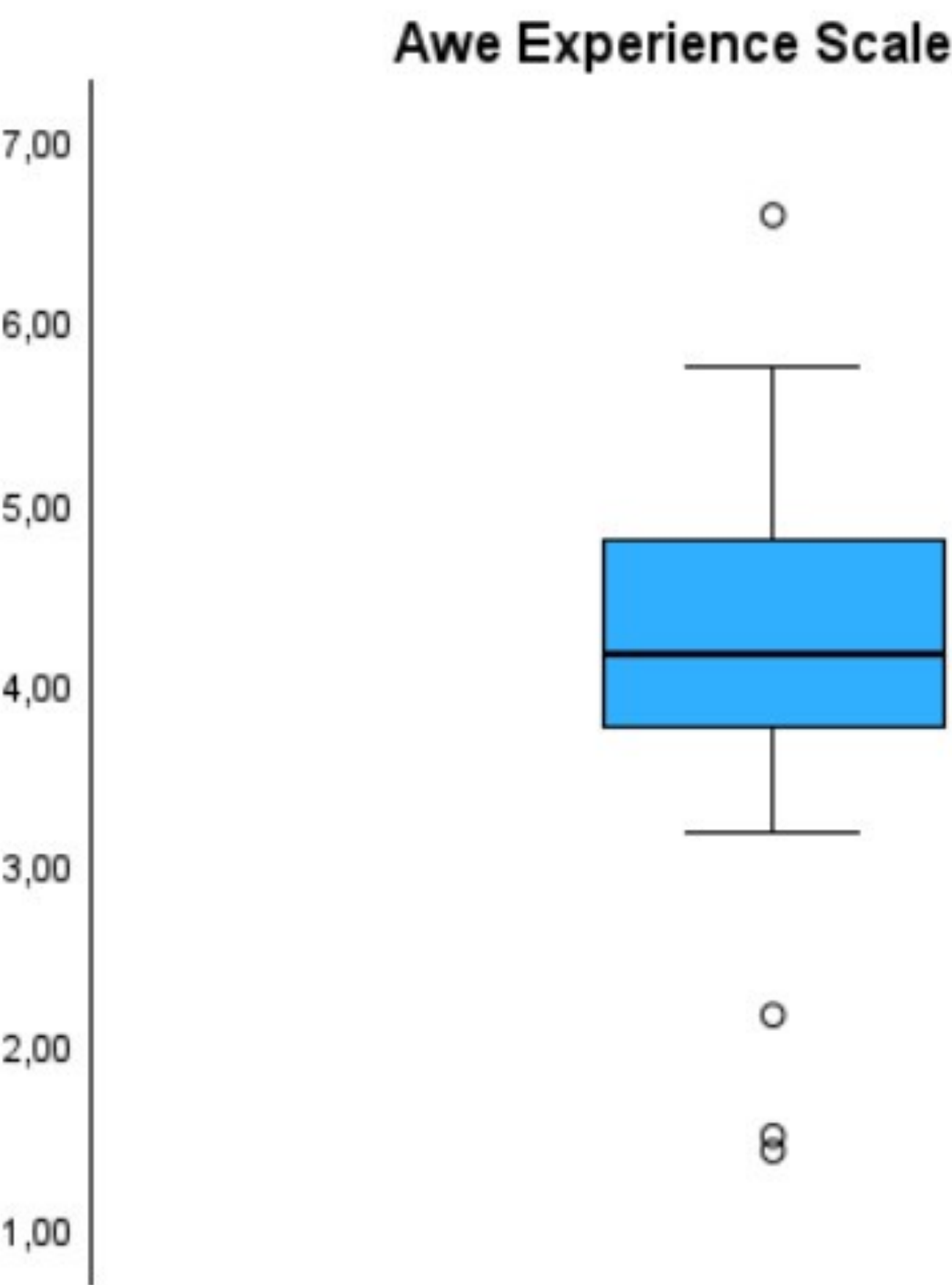


● 17 - 35 ● 36 - 50 ● 50 - 83

Preliminary results



Preliminary results



Preliminary results

- Ocean-Friendly Behaviors

- $n = 17$ matched participants from pre-test and follow-up (3 weeks after workshop)
- M pre-test = 3.49, M follow-up = 3.63, $p < .19$

⇒ All results do not yet take into account differences in terms of workshop, socio-demographics, level of nature connectedness, and visit frequency to the coast

- Ocean Literacy: mean percentage of correct answers 35% (workshop in London) and 60% (workshop in Ostend)

- Sound with the less correct answer: “seal moan” (confusion with vessel impact on sea ice)
- Sound with the most correct answer is “vessel”



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**2021
2030** United Nations Decade
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