UNDERSTANDING THE VISUAL IMPACTS OF WOOD ON HUMAN WELLBEING

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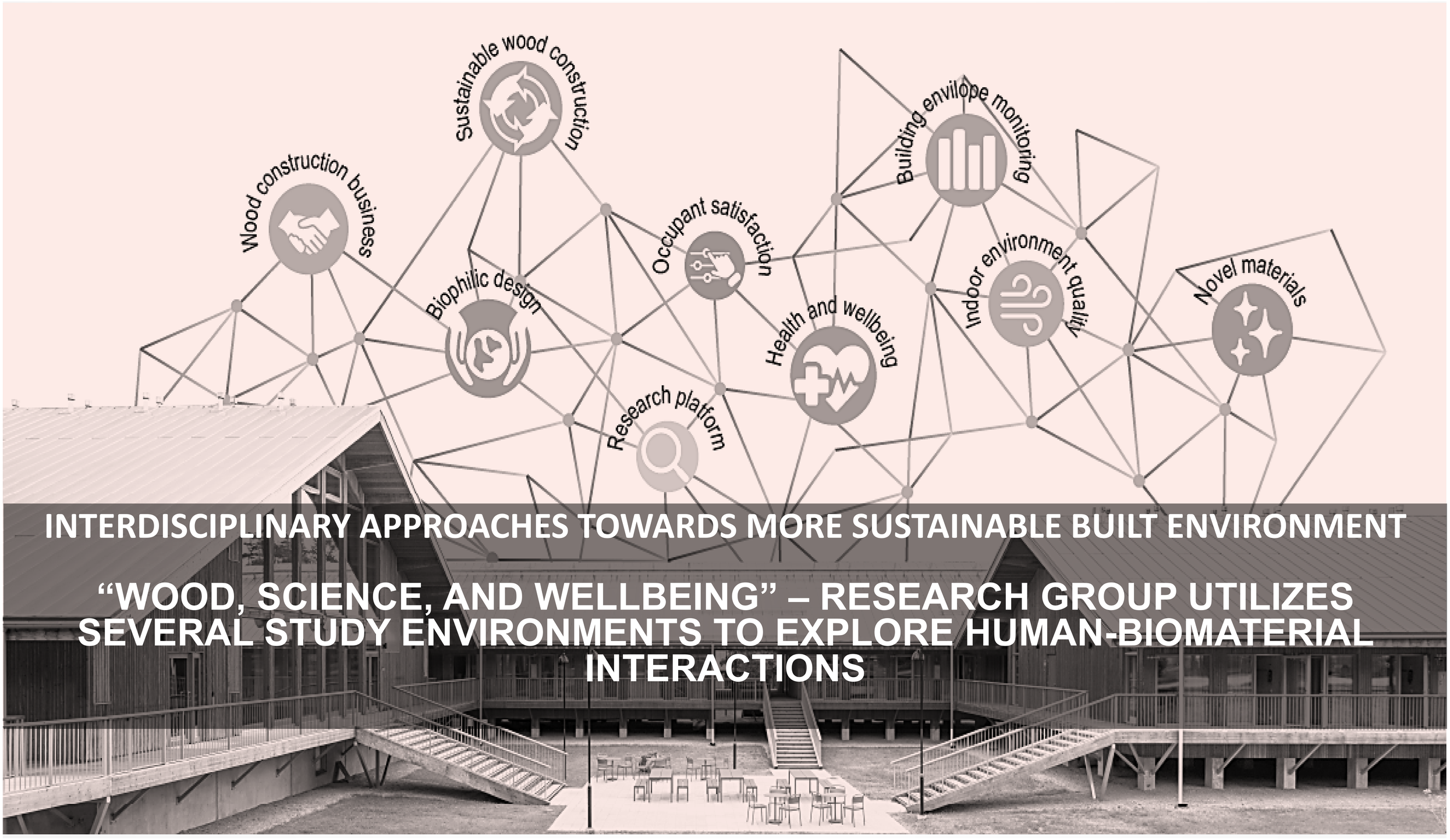
VISUAL IMPACTS OF WOOD – RESEARCH ASPECTS

Theoretical Frameworks	Aspects of Visual Impact	Definition of Human Well-Being	Research Methodologies	Study Design Considerations
•Attention Restoration Theory •Biophilia Hypothesis •Goal Discrepancy Framework …	•Aesthetic •Psychological •Social Dimensions	•Mental Health •Stress Reduction •Productivity •Social Interaction	•Qualitative •Quantitative •Observational	•Field Studies •Visual Analysis •Long-term •Short-term



INTERDISCIPLINARY APPROACHES TOWARDS MORE SUSTAINABLE BUILT ENVIRONMENT

“WOOD, SCIENCE, AND WELLBEING” – RESEARCH GROUP UTILIZES SEVERAL STUDY ENVIRONMENTS TO EXPLORE HUMAN-BIOMATERIAL INTERACTIONS

PSYCHOPHYSIOLOGICAL & PERCEIVED WELLBEING AND HUMAN-MATERIAL INTERACTIONS IN BUILT ENVIRONMENTS

Physiology + Environmental conditions + Experienced life

(1) How does the built environment affect people's well-being in short- and long term?

(2) Can psychophysiological stress be reduced by adding bio-based, biophilic elements to indoor spaces – how, why, quantification, link to sustainability indicators?

(3) What are the critical elements of biophilic urbanism?

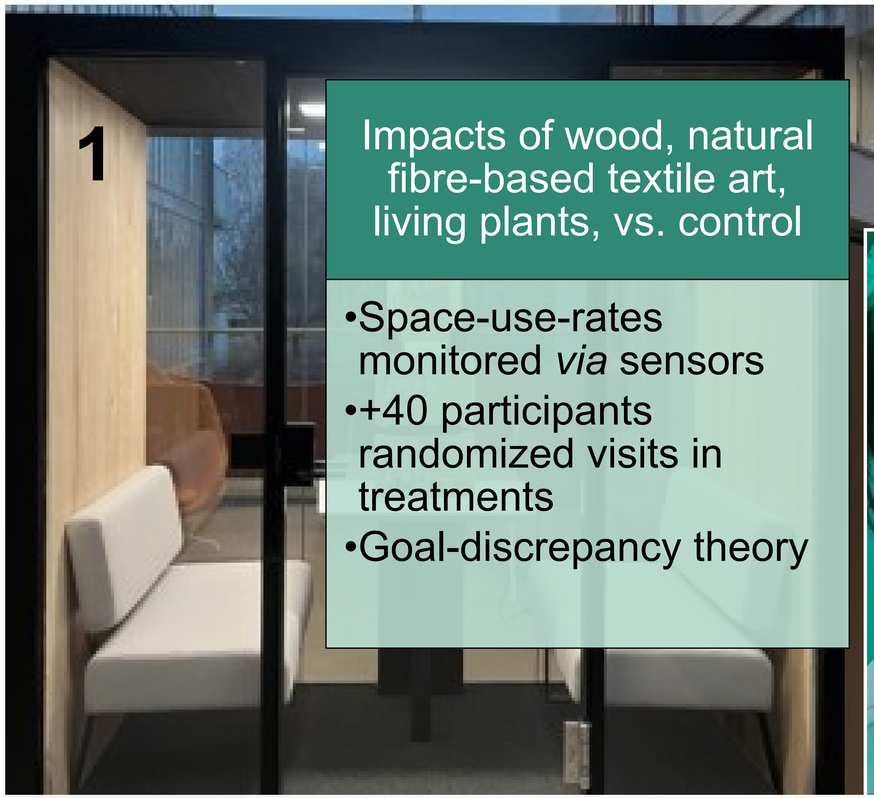
(4) How to improve holistic well-being and resilience in the built environment?

(5) How do consumers prefer different materials?

1. VIIKKI WORKING HUBS: MODIFIABLE WALLS.

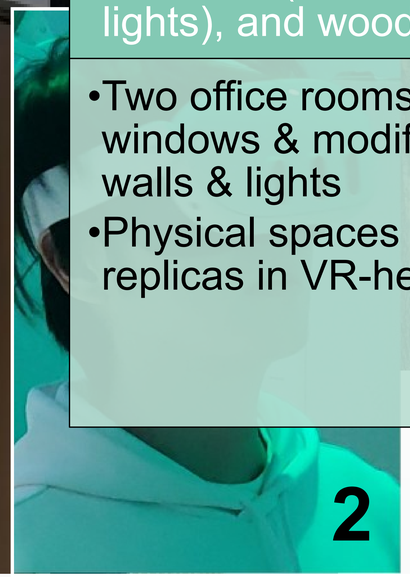
2. IMMERSIVE VR-SPACES, REPLICAS OF REAL PHYSICAL SPACES.

3. VIRTULAB OF LUKE WITH FULLY IMMERSIVE 360°-ROOMS.



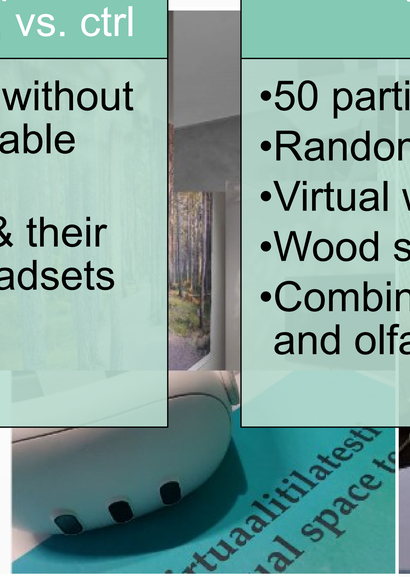
Impacts of wood, natural fibre-based textile art, living plants, vs. control

- Space-use-rates monitored *via* sensors
- +40 participants randomized visits in treatments
- Goal-discrepancy theory



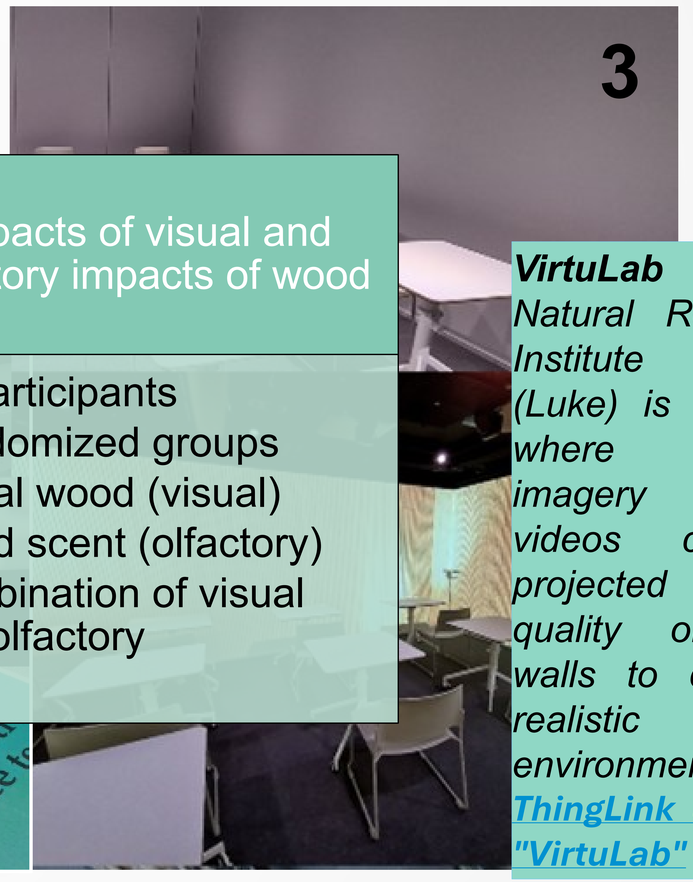
Comparisons between different biophilic elements (nature photos, lights), and wood, vs. ctrl

- Two office rooms without windows & modifiable walls & lights
- Physical spaces & their replicas in VR-headsets



Impacts of visual and olfactory impacts of wood

- 50 participants
- Randomized groups
- Virtual wood (visual)
- Wood scent (olfactory)
- Combination of visual and olfactory



VirtuLab *at the Natural Resources Institute Finland (Luke) is a facility where 360° imagery and/or videos can be projected in high quality onto the walls to create a realistic virtual environment.*

ThingLink Scenario "VirtuLab"

Photos: Reetta Nakari, Tuula Jyske, Valtteri Kutvonen and Saša Tkalčan.

4. HYYTIÄLÄ LIVING LAB

Cross-over trial	Comparisons between new and old timber and concrete buildings	Long-term trial over 3 years, altogether 5 periods
•Same persons accommodated in different conditions •Psychological validated surveys & physiological monitoring with Oura rings	•+100-year-old timber building •Modern CLT buildings •Concrete and tile-based buildings from 60-70s	•Healing interiors -pilot 2023 summer & fall, summer and fall 2024, summer 2025 •Accommodation lenght:1-9 weeks •+60 participants

Living Lab at Hyytiälä has wooden accommodation rooms with IEQ sensors and wearable technologies to monitor occupants wellbeing.

Photo: Jussi Valkeajoki

ONGOING CASE STUDY:

WHAT WAS THE MOST PLEASANT ENVIRONMENT FOR WORKING OR STUDYING?

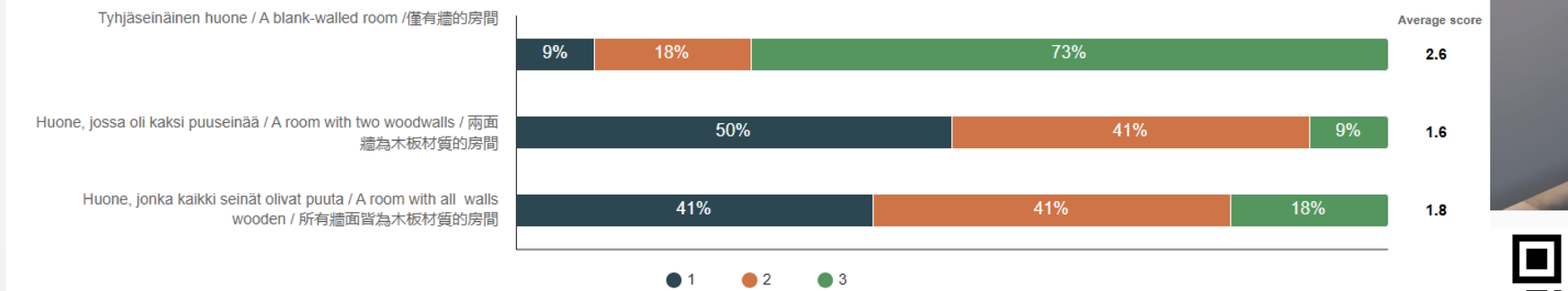
RANK THE ENVIRONMENTS IN ORDER OF PREFERENCE:
1. YOUR FAVORITE, 2. SECOND BEST, 3. THE LEAST FAVORABLE.

Mikä oli miellyttävin tila työskentelyyn tai opiskeluun? Aseta tilat paremmuusjärjestykseen, 1. suosikkisi, 2. toiseksi paras, 3. huonoin.

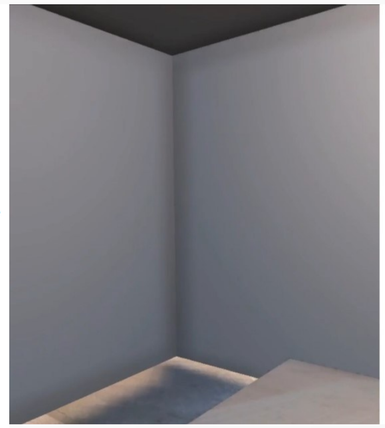
What was the most pleasant environment for working or studying? Rank the environments in order of preference: 1. your favorite, 2. second best, 3. the least favorable.

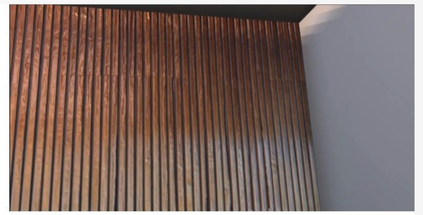
哪一種環境最讓您覺得適合工作或學習? 請依喜好順序排列：1 = 最喜歡，2 = 次佳，3 = 最不喜歡。

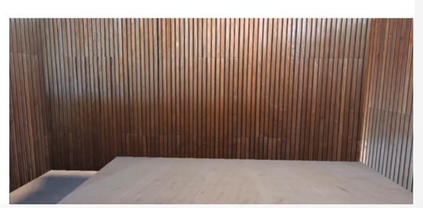
Number of respondents: 22



	1	2	3
Tyhjäseinäinen huone / A blank-walled room /僅有牆的房間	9.1%	18.2%	72.7%
Huone, jossa oli kaksi puuseinää / A room with two woodwalls / 兩面牆為木板材質的房間	50.0%	40.9%	9.1%
Huone, jonka kaikki seinät olivat puuta / A room with all walls wooden / 所有牆面皆為木板材質的房間	40.9%	40.9%	18.2%

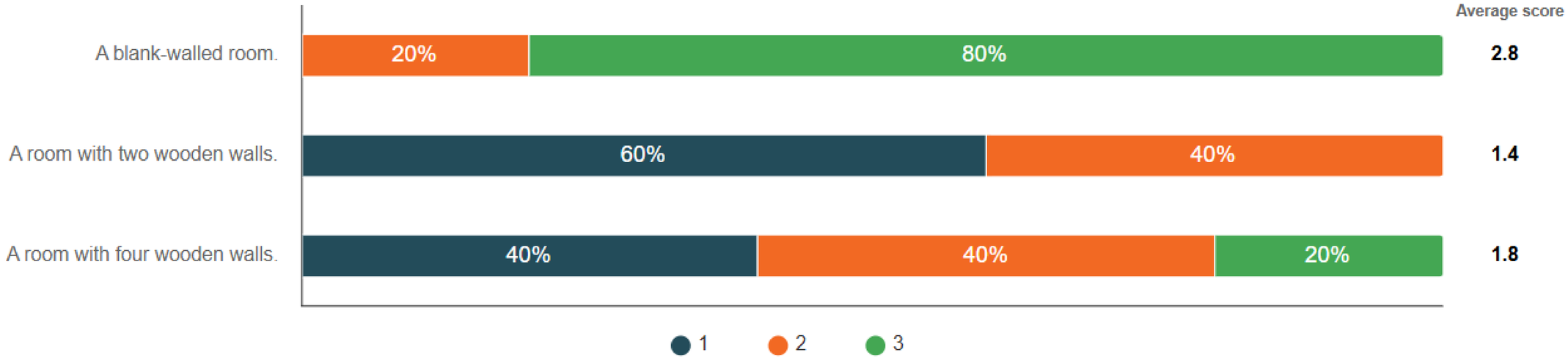






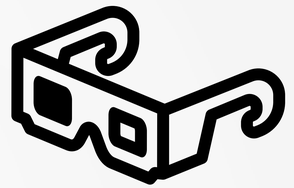
YOUR RESULTS TODAY

What was the most pleasant environment for working or studying?
Rank the environments in order of preference:
1. Your favorite, 2. Second best, 3. The least favorable.
Number of respondents: 10



	1	2	3
A blank-walled room.	0.0%	20.0%	80.0%
A room with two wooden walls.	60.0%	40.0%	0.0%
A room with four wooden walls.	40.0%	40.0%	20.0%

CITATIONS & DISCUSSION



- *“…with imagination different feelings, favorite whole timber room, although most of ppl like mixture…”*
- *“…mixture of everything, whole wooden room is very sterile…”*
- *…”carpenter: each scenario created a very different feeling; it is a question of the right amount – prefers a mixtures; depends on the color and the type of wood; two wooden walls, two concrete ones…”*
- *“…first with all the wood, normally the mixture…”*

- **More interdisciplinary research needed, on different topics (acoustics, odors, …)**
- **Communication ongoing, emotions and feelings important to interpret the scientific data into easy-to-understand -messages for customers**