InnoRenew CoE

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Wood protection techniques and natural weathering: their effect on aesthetics and preference of people

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Wood treatments and weathering influence aesthetics

- Wood treatments and weathering change **tactile and visual properties** of wood
- Why care?
  - These properties influence user **selection of materials**
  - They may **influence human health**

What makes wood aesthetically pleasing?

- Which properties have the largest role?
  - colour?
  - roughness?
  - glosiness?
  - combination?
  - something else?

- How much preferences vary between people?

Method - Samples

- **30 weathered** and **30 unweathered** wood samples (7x15x1cm)

- From six tree species
  - untreated wood
  - treated wood
    - coating
    - thermal modIfication
    - chemical modification
    - combination

Method - Assesment of samples

- **colour (CIE Lab)**
  - L* (lightness) (0-100)
  - a*(green-red) (-128 to +127)
  - b*(blue-yellow) (-128 to +127)
- **glossines**
  - gloss units (0-100)
- **subjective properties**
  - roughness, dryness, naturalness (7-point Likert scale)

Method – Study procedure

- Which are **your favourite materials** (for an outdoor table top surface)?
- 4 parts of the study

Part	Samples	Type	Participants	Instruction
1.	30	unweathered	25	Rank 5
2.	10	unweathered	51	Rank 10
3.	30	**weathered**	25	Rank 5
4.	10	**weathered**	51	Rank 10

Method - Participants

- Students and faculty staff (152 participants)
- Average age 25.41 (SD = 7.12)
- 50.66% of women
- Without a background in wood science

Results – Part 1 (unweathered)

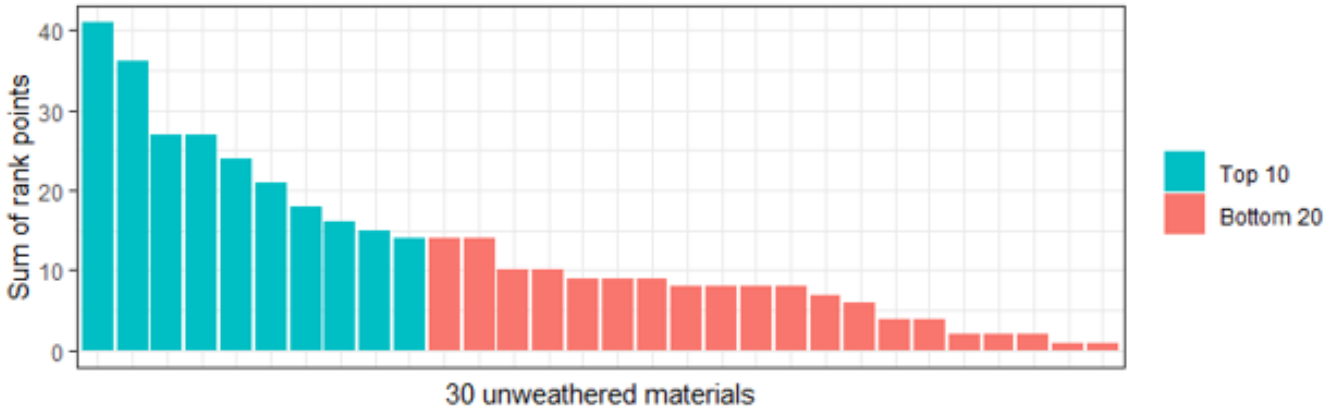
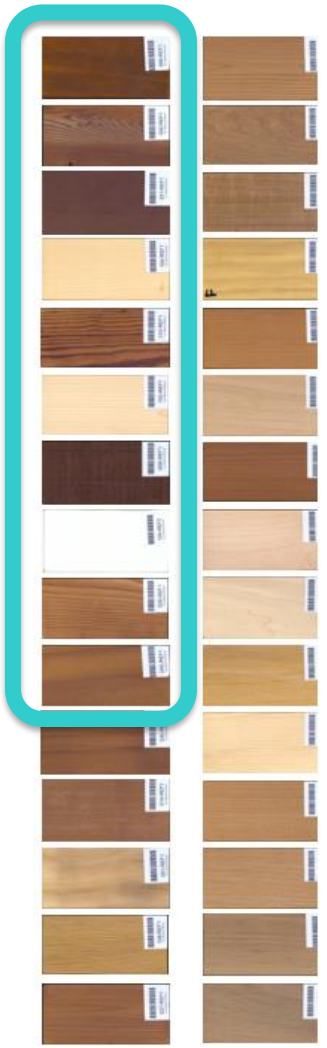
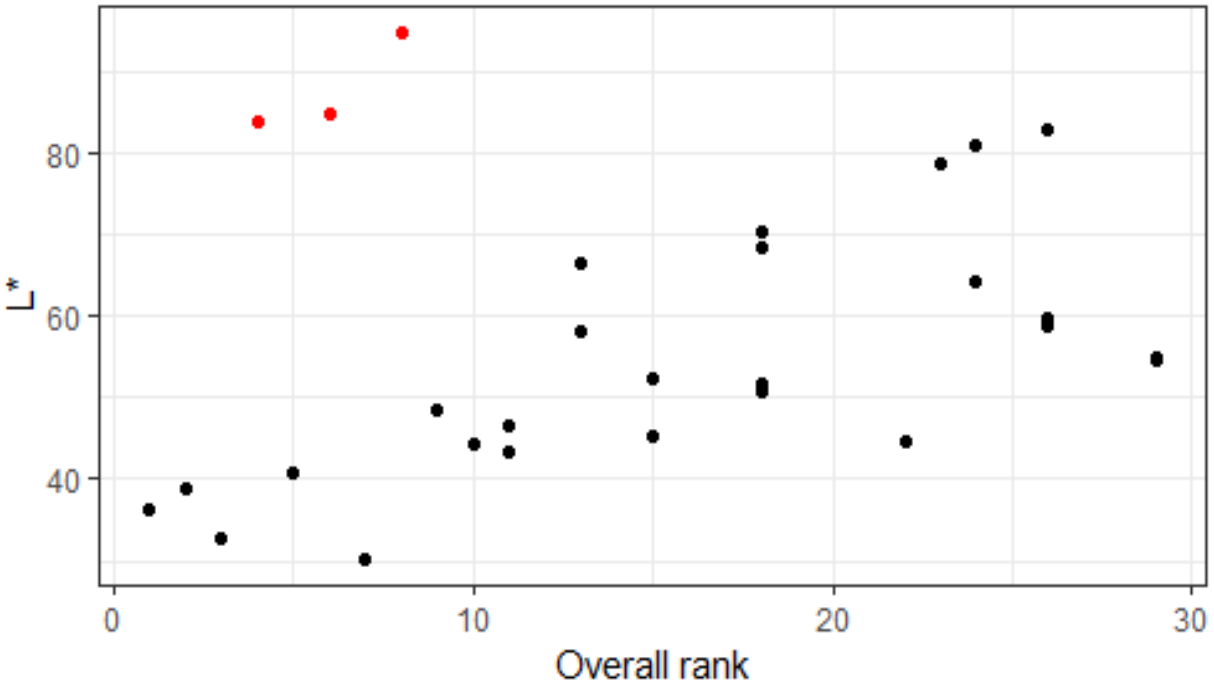


Figure 4: Sum of rank points (top) and number of received ranks (bottom) for 30 samples



Results – Part 1 (unweathered)



Results – Part 2 (unweathered)

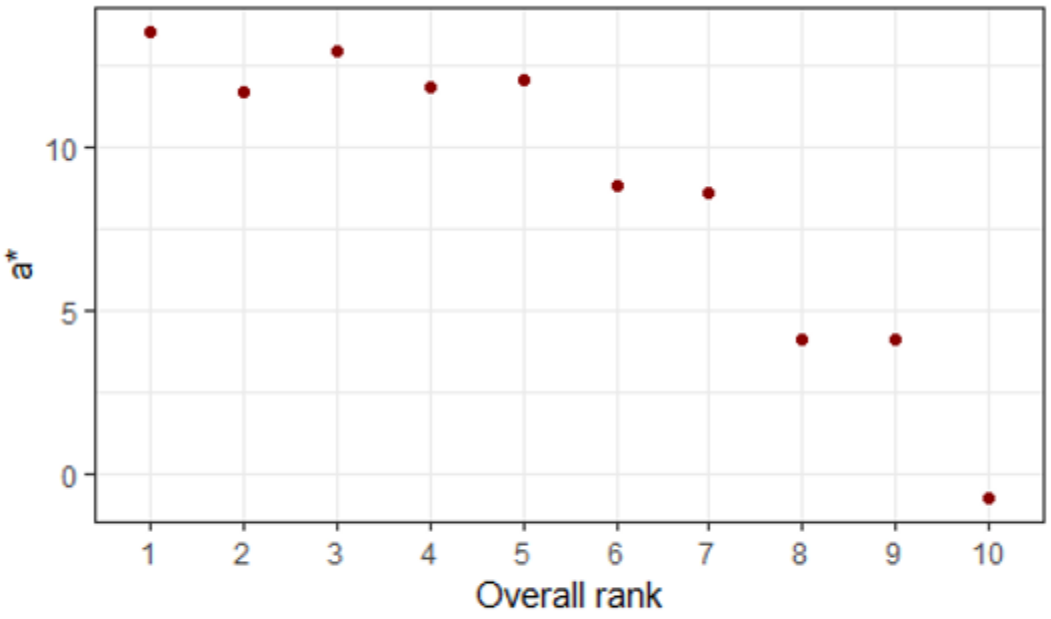


Figure 6: Relationship between a*(green-red) and overall rank

Results – Part 3 (weathered)

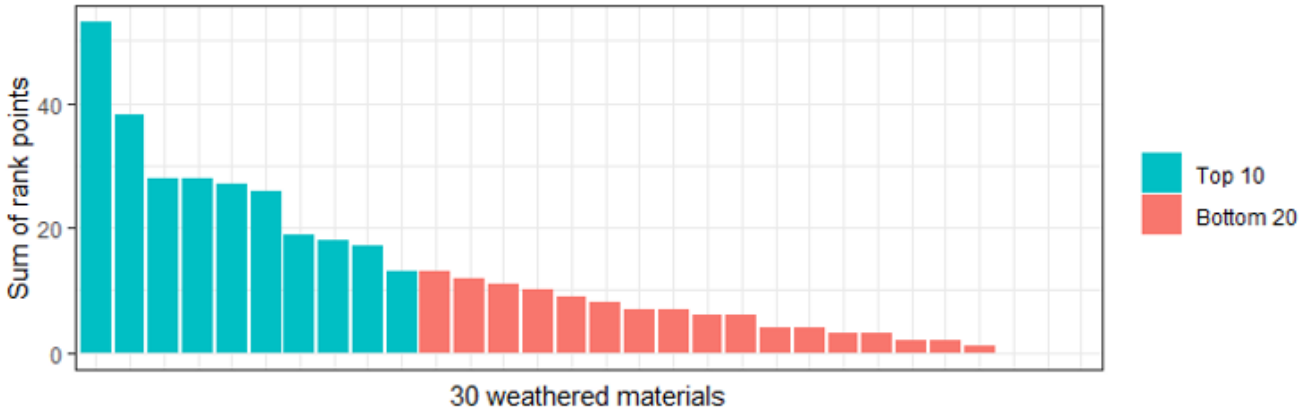
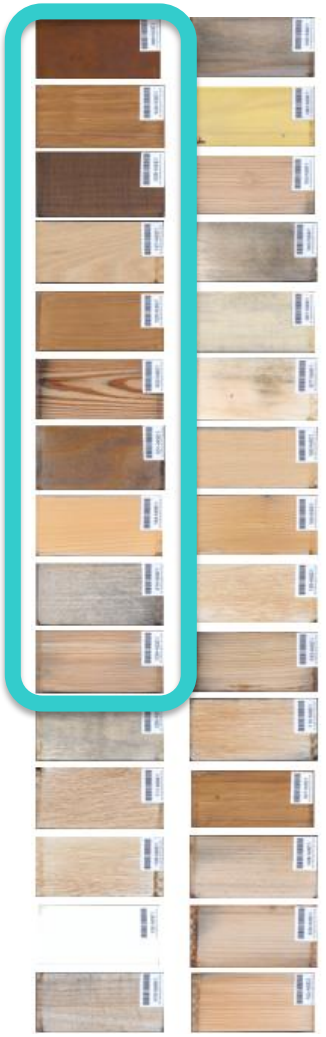


Figure 11: Sum of rank points (top) and number of received ranks (bottom) for 30 samples



Results – Part 3 (weathered)

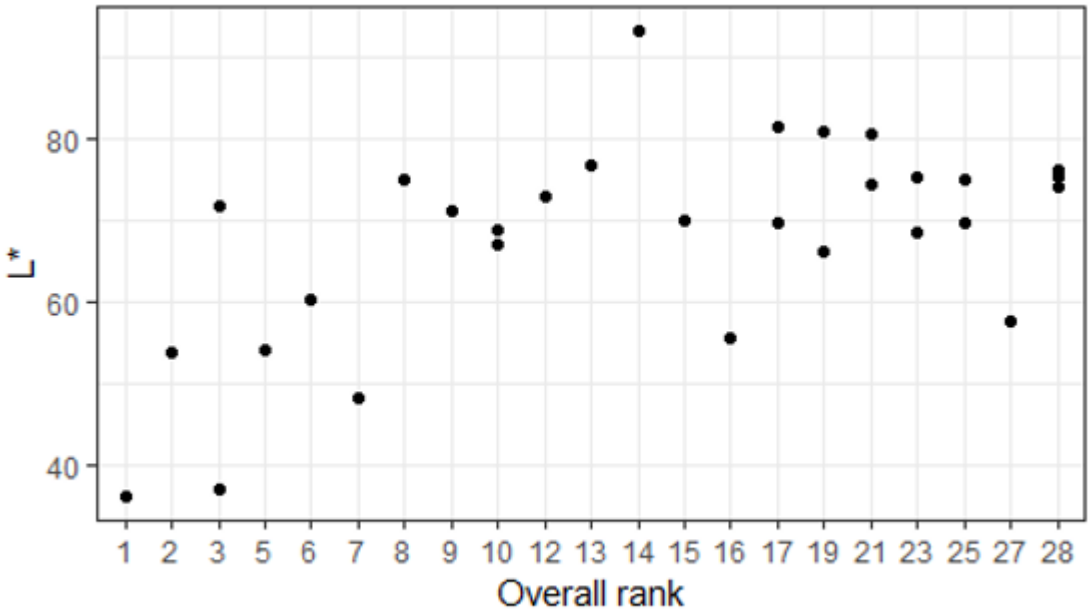


Figure 9: Relationship between L*(lightness) and overall rank

Results – Part 3 (weathered)

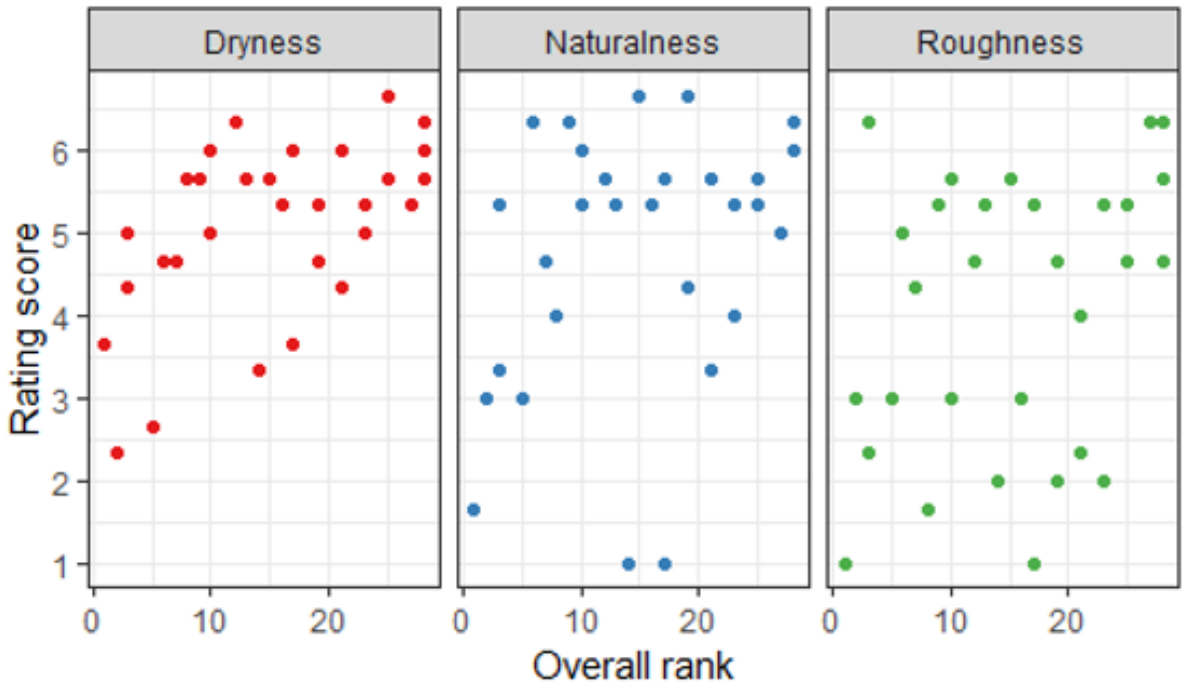


Figure 10: Relationship between subjective ratings and overall rank

Results – Part 4 (weathered)

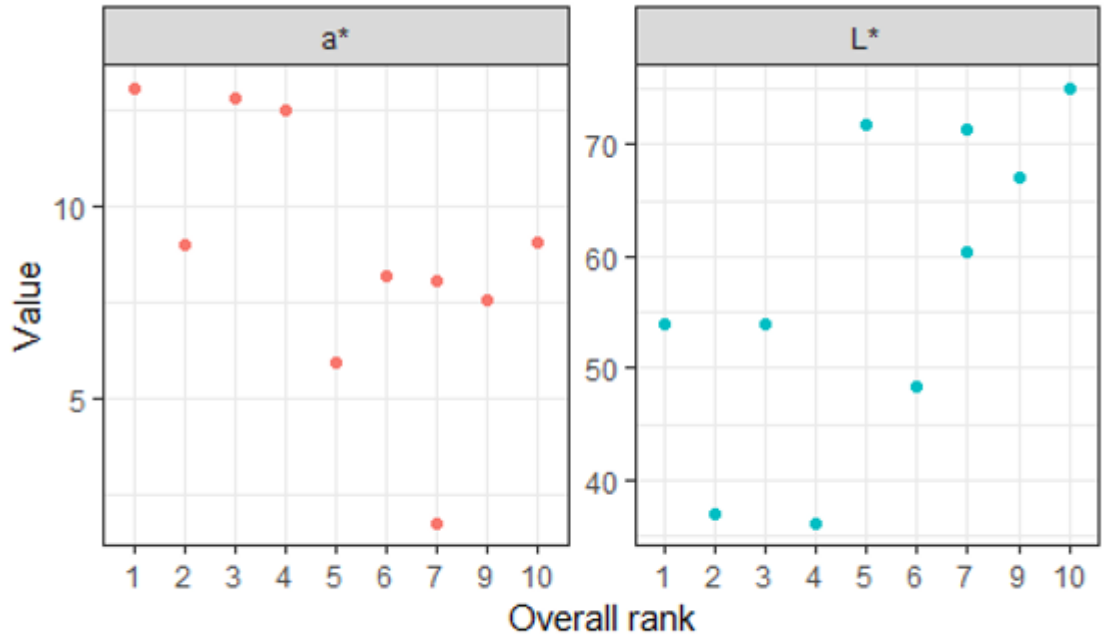


Figure 13: Relationship between a*(green-red) and L*(lightness) and overall rank

Results – Part 4 (weathered)

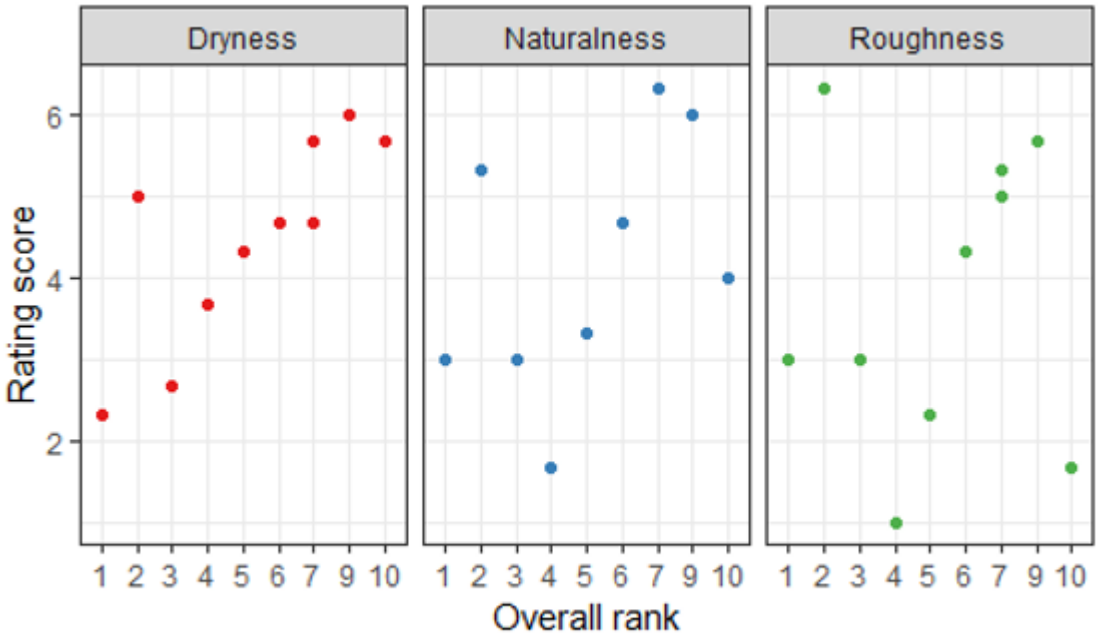


Figure 14: Relationship between subjective ratings and overall rank

Conclusions

- Preference was associated with material lightness, red-green colour hue, and dryness

- Such research can help us **develop and adapt wood treatment methods** that will create appealing products and **encourage wood use**

Next steps

- How does preference of materials vary with:
  - context?
  - gender, age, culture?

- Can we **incorporate human preference information in decisions** of wood scientists, architects, designers, and other building professionals?

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Thank you for your time.

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