An original approach for selecting a specific sensitive panel based on physiological measurements - Application to thermal perception

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G. HAESE | A. COUZINET

CONTEXT AND OBJECTIVES

Subtle differences between similar products sometimes difficult to measure.

Commonly used methodology involving expert panellists designed to reduce inter-individual differences but the sensitivity still differs from one person to another.

Specific selection of panellists developed to **minimize inter-individual differences** in order to **improve discrimination**.

Proposition of an innovative methodology for panel construction to obtain a **group of panellists responding subtly and homogeneously** on the studied sense.

MATERIALS AND METHODS

Step 1 | Pre-selection of 20 subjects among a large representative sample

Inclusion criteria:

- aged from 18 to 46,
- normal BMI,
- non-smokers,
- high declared sensitivity to thermal stimuli.

Thermal sensitivity assessed with a screening questionnaire comparing daily life thermal behaviour to average population.

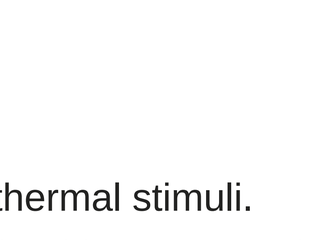
Step 2 | Quantitative evaluation of thermal skin sensitivity

Using a thermode at the forearm centre of each participant.

Determination of cold and warm temperature thresholds declared by each panellist in response to brief stimuli delivered by the thermode.

Step 3 | Monitoring of physiological responses to specific thermal stimulus on the skin

- Heart rate,
- Respiratory rate,
- Skin blood flow,
- Electrodermal response,
- Skin temperature.



Step 4 | 10 panellists chosen for their cold and hot stimuli low thresholds

Limitation of the thermal perception discrepancy of the panel, and high individual physiological responses to these stimuli.

Objectification of induced human stress.

MAIN RESULTS

Neutral skin temperature

32°C

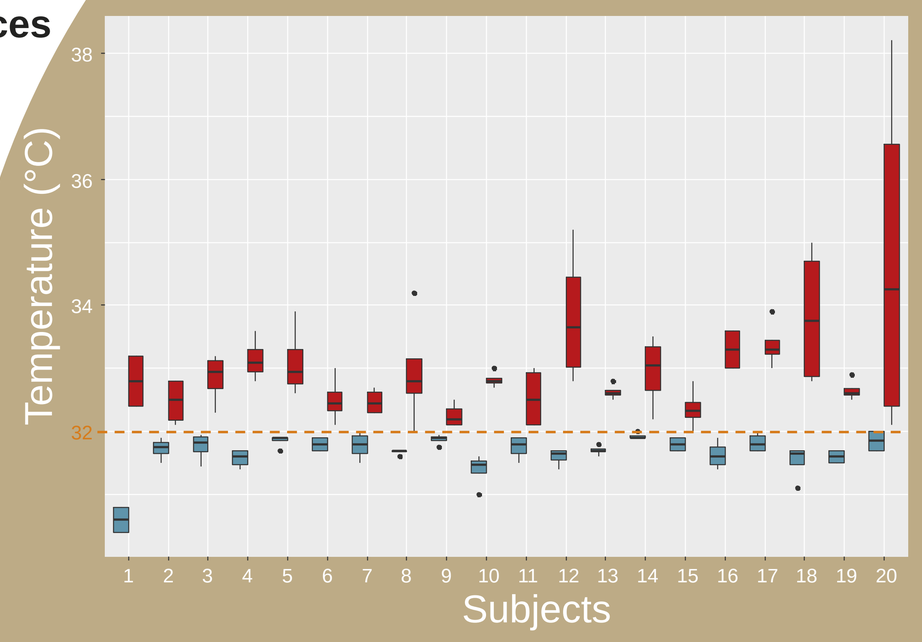


Figure 1: Boxplots of the cold and hot thresholds of the 20 pre-selected subjects measured with a thermode

Subjects selected for having the closest cold and hot thresholds to neutral temperature

→ able to perceive very subtle changes in temperature

Extreme behaviours detected for subjects 1 and 20

CONCLUSION AND PERSPECTIVES

Insights on extreme behaviors, not highlighted using only self-reported thresholds

Construction of very homogeneous groups

Higher discrimination

Study of groups with **dedicated behaviors**

Methodology **adaptable** to meet the needs of the study

Evaluation of thermal comfort in automotive passenger compartments and energetic consumption linked to **subjects' specific behaviour** in response to cold environments

CONTACT

Gwénaëlle HAESE
Research and Consulting Engineer in Sensory Analysis and Physiology
Tel.: +33 (0)2 40 37 20 65 / gwenaelle.haese@cstb.fr
http://recherche.cstb.fr/en/services/specialist-area/health-comfort/pulse/

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