

# Sensory profiling

## Methodology for objectively characterizing and measuring product characteristics

Sensory profiling, or Descriptive Sensory Analysis, is a strong method for describing products and differences between products.

The main idea in sensory profiling is to, as objectively as possible, measure product characteristics using human assessors on a range of relevant attributes.

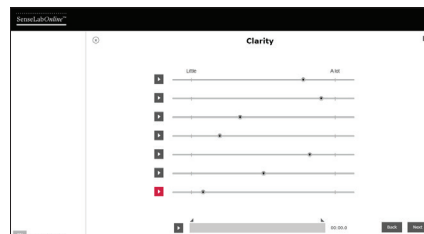
Over the last decade sensory profiling has spread in the audio industry as a reliable method for gaining knowledge about a products sensory characteristics. Successful application areas range from telephone systems [1] to spatial sound reproduction [2], headphones [3], hearing aids [4], ANC headphones [5] etc.

### ATTRIBUTE DEVELOPMENT

An important aspect of sensory profiling is the development of a relevant vocabulary for describing a given product category. This procedure ensures easily understood results, which are relevant to the perception of the product.

There are several ways to perform attribute development, and the applied methodology

varies as a function of product categories and experiment ambitions.



A typical SenseLabOnline implementation of a sensory profiling test. Systems (technologies under test) are being rated on level of bass.

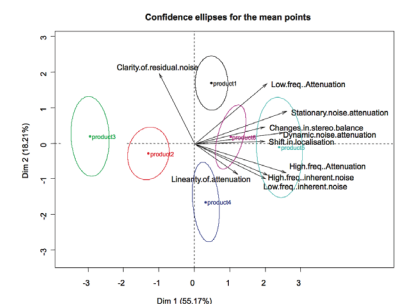
### PANELS AND ASSESSORS

An expert panel [6] is the backbone for collecting data in traditional sensory profiling. SenseLab maintains a panel of carefully selected and trained assessors who provide us with objective measurements within the sensory modalities of hearing, vision and touch.

We continuously monitor our assessors' performance, making sure that we live up to high standards in delivering good and objective data sets in sensory profiling.

### RESULTS AND ANALYSIS

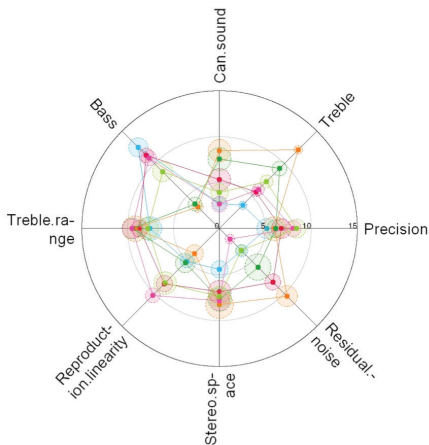
Statistical analysis of sensory profiling data requires considerations with regards to assessor evaluation, data quality control, and the general multi-dimensional nature of product perception.



Example of a HMFA analysis on a sensory profiling of Active Noise Cancelling (ANC) headphones.

SenseLab has highly efficient procedures for building tests, gathering data, and performing data analysis.

Our statistical analysis includes all procedures necessary to ensure reliability of the obtained results, using graphs for easy overview of the results.



Spider/radar plot showing the profile of an ANC headphone. Circles represent 95% confidence intervals

### THE TEST STEP-BY-STEP

A typical sensory profiling test can roughly be divided into four steps:

1. Attribute development
2. Training the panel for relevant domain
3. Data collection
4. Performing data analysis for assessor feedback and product profiles

### SENSORY PROFILING

- Is recommended for continuous benchmarking in R&D
- Gives input to marketing effort
- Provides deep understanding of perceived product characteristics
- Can be used in internal and external validation of R&D efforts
- Development of a vocabulary for describing product category characteristics
- Typically applies an expert panel (ISO 8586-2)
- Applies multivariate statistics

[1] Mattila, V. V. (2001). Perceptual analysis of speech quality in mobile communications. Tampere University of Technology.

[2] Zacharov, N. (2000). Perceptual studies on spatial sound reproduction systems. Helsinki University of Technology

[3] Lorho, G. (2010). Perceived quality evaluation: An application to sound reproduction over headphones. Aalto University.

[4] Legarth, S.V., Simonsen, C.S., Bramsløw, L., Le Ray, G., Zacharov, N. (2010). Sensory evaluation of hearing aid performance based on normal-hearing listeners. In Proceedings of the 3rd International Workshop on Perceptual Quality of Systems (PQS) (Dresden, Germany).

[5] Zacharov, N., Ramsgaard, J., Le Ray, G., & Jørgensen, C. V. (2010). The multidimensional characterization of active noise cancellation headphone perception. Quality of Multimedia Experience (QOMEX) (Trondheim, Norway).

[6] ISO 8586-2:1994. Sensory analysis - General guidance for the selection, training and monitoring of assessors - Part 2: Experts.

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