# Napping by modality: a happy medium between analytic and holistic approaches

**Johann C. Pfeiffer and Chantal C. Gilbert**

Consumer & Sensory Sciences Department
Campden & Chorleywood Food Research Association



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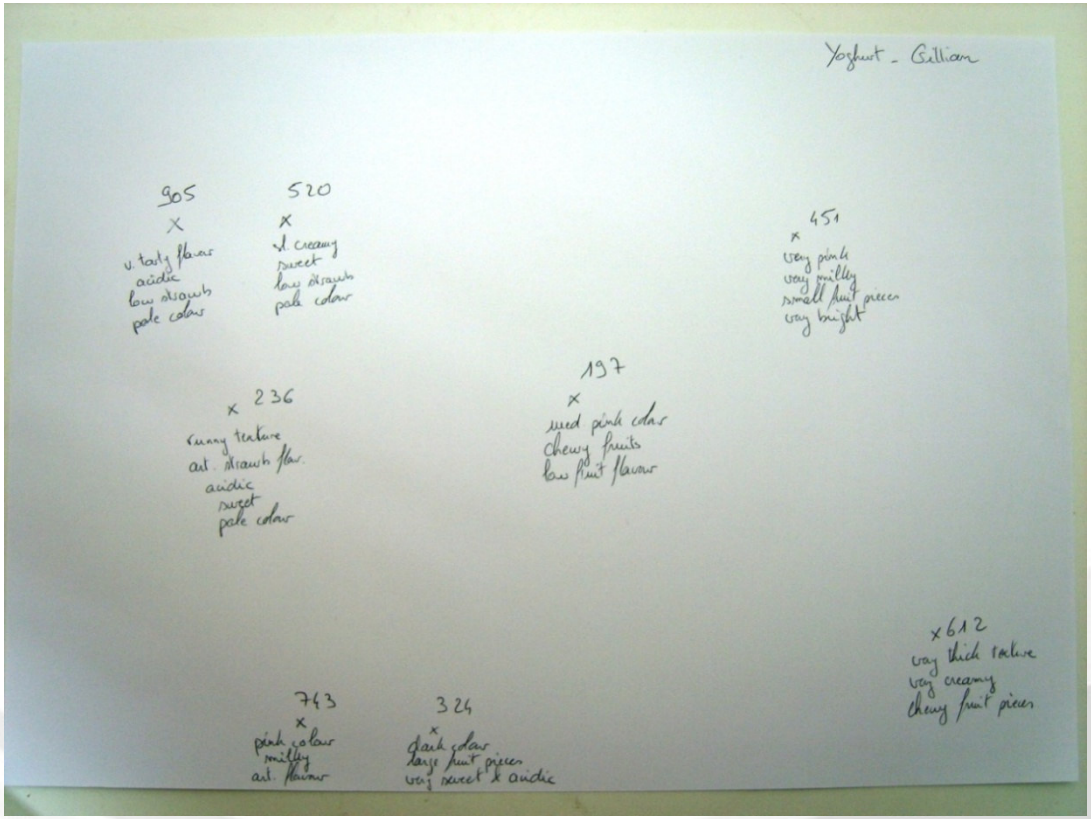
# Introduction: the Napping® method

- Projective mapping first introduced by Risvik *et al.* 1994.
- Napping® - elaborated by Pagès and colleagues, who introduced the use of Multiple Factor Analysis (MFA) to analyse the data.
- Synthesised method of data collection: assessors position products on a two dimensional surface (e.g. large sheet of paper) according to *overall* sensory similarities and differences.
- Assessors are free to choose the various criteria used to separate the products.
- Assessors often asked to enhance the map with descriptive terms for each product (Ultra-Flash Profiling).

# Napping con't

**Example of a panellist's nappe:**




- MFA on Napping + UFP data: provides a quick profile showing relationship between products and descriptors, similar to PCA results from conventional profiling.
- MFA is a multi-block method of analysis, which can be regarded as an enriched PCA where inter-individual variations are taken into account.

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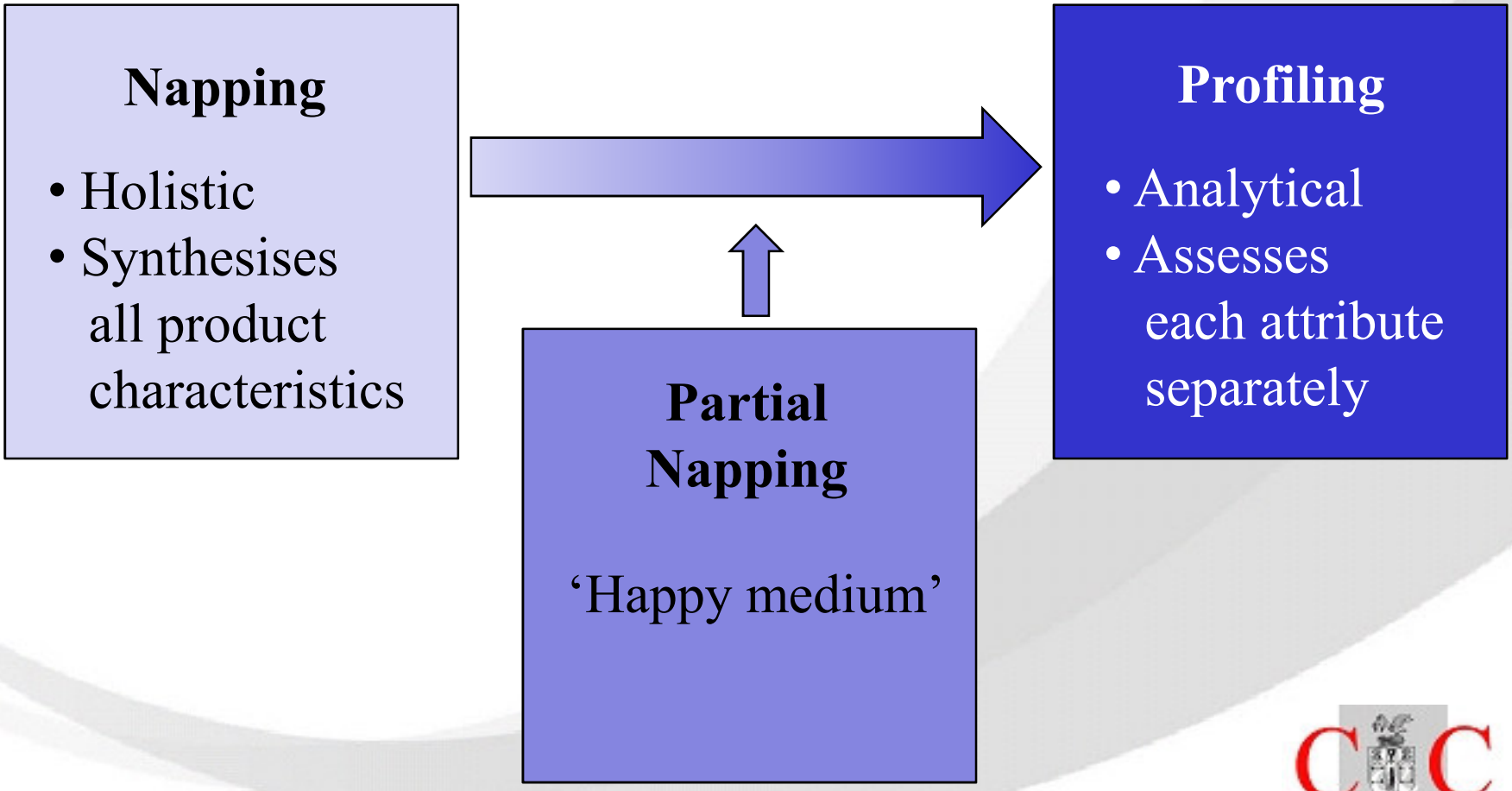
# Introduction to Partial Napping (or Napping by modality)

- Idea first suggested by Pagès (2003)
- Conduct a 'Napping' exercise separately for each relevant sensory modality e.g. appearance, odour, flavour, texture...
- MFA can be used to create a consensus map for each individual modality.
- Hierarchical Multiple Factor Analysis (HMFA) can be applied to create an overall consensus map of the products while preserving the contribution of each sensory modality.

# Research objectives & Hypothesis

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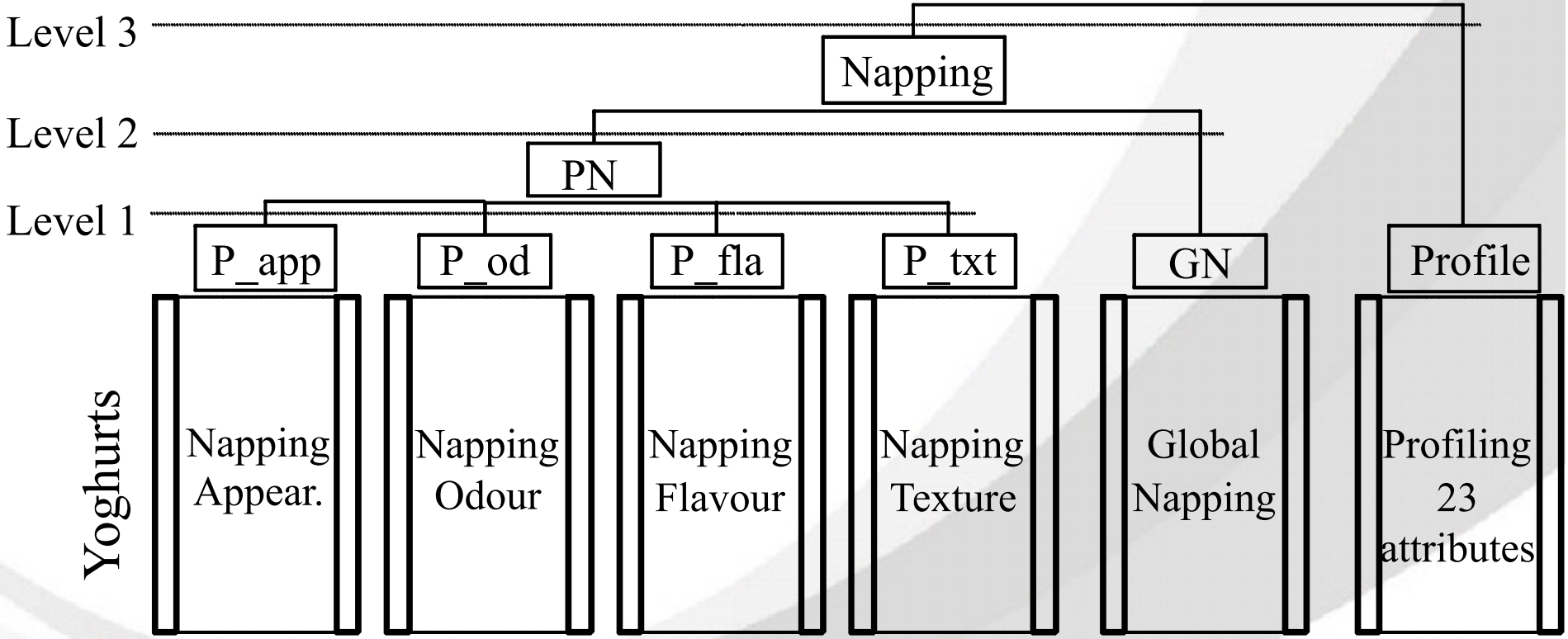
# Methods

- Global Napping
  - Global Napping was undertaken using 7 trained sensory assessors.
- Partial Napping
  - A separate Napping exercise was undertaken for each sensory modality: appearance, odour, flavour and texture (same 7 assessors).
- Descriptive profiling
  - 8 trained sensory assessors, 2 replications.
- Each method was applied to a set of 8 strawberry yoghurt samples.

# Data analysis

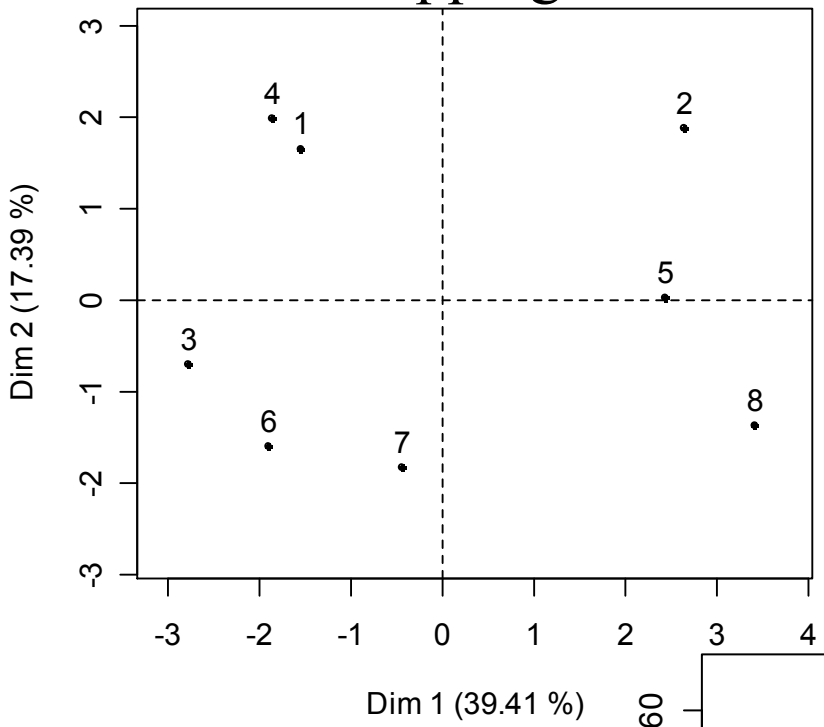
- Data analysed using the R® software (v2.7.0) using SensoMineR and FactorMineR packages (v1.08).
- Each method was analysed and compared using RV and NRV coefficients.
- HMFA was used to simultaneously analyse and compare the configurations from:
  - Global Napping
  - Partial Napping
  - Profiling
- The following hierarchy was applied:

# HMFA

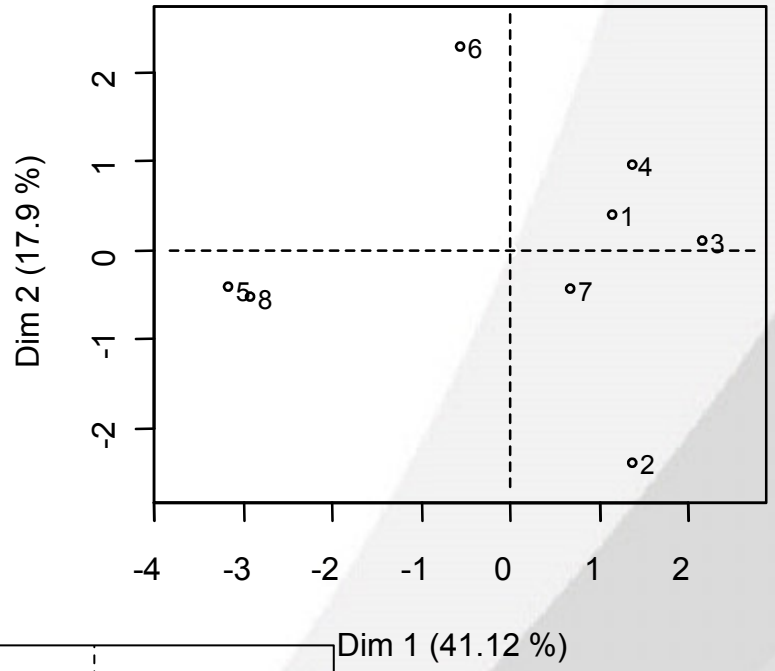


# Results

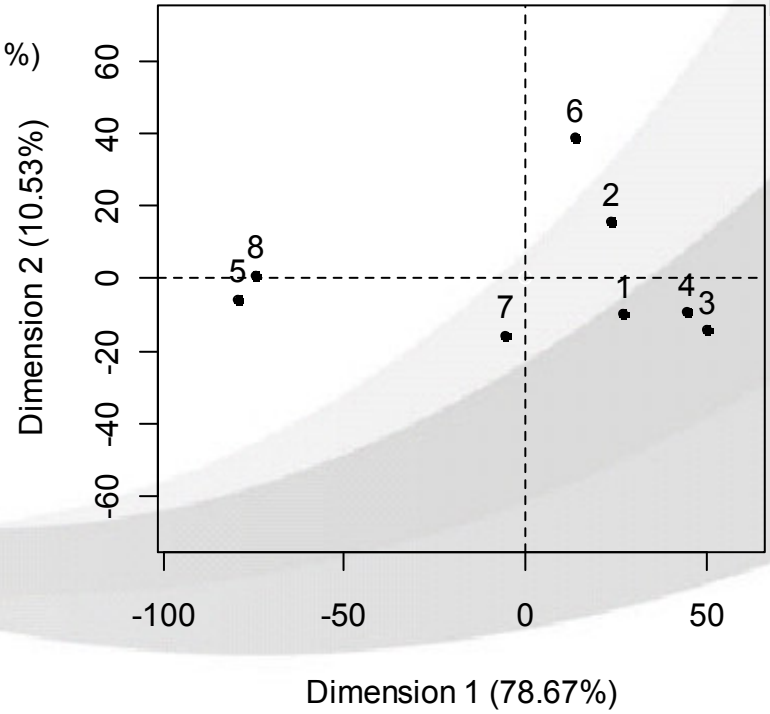
# Global Napping - MFA




# Partial Napping - HMFA




# Profiling - PCA

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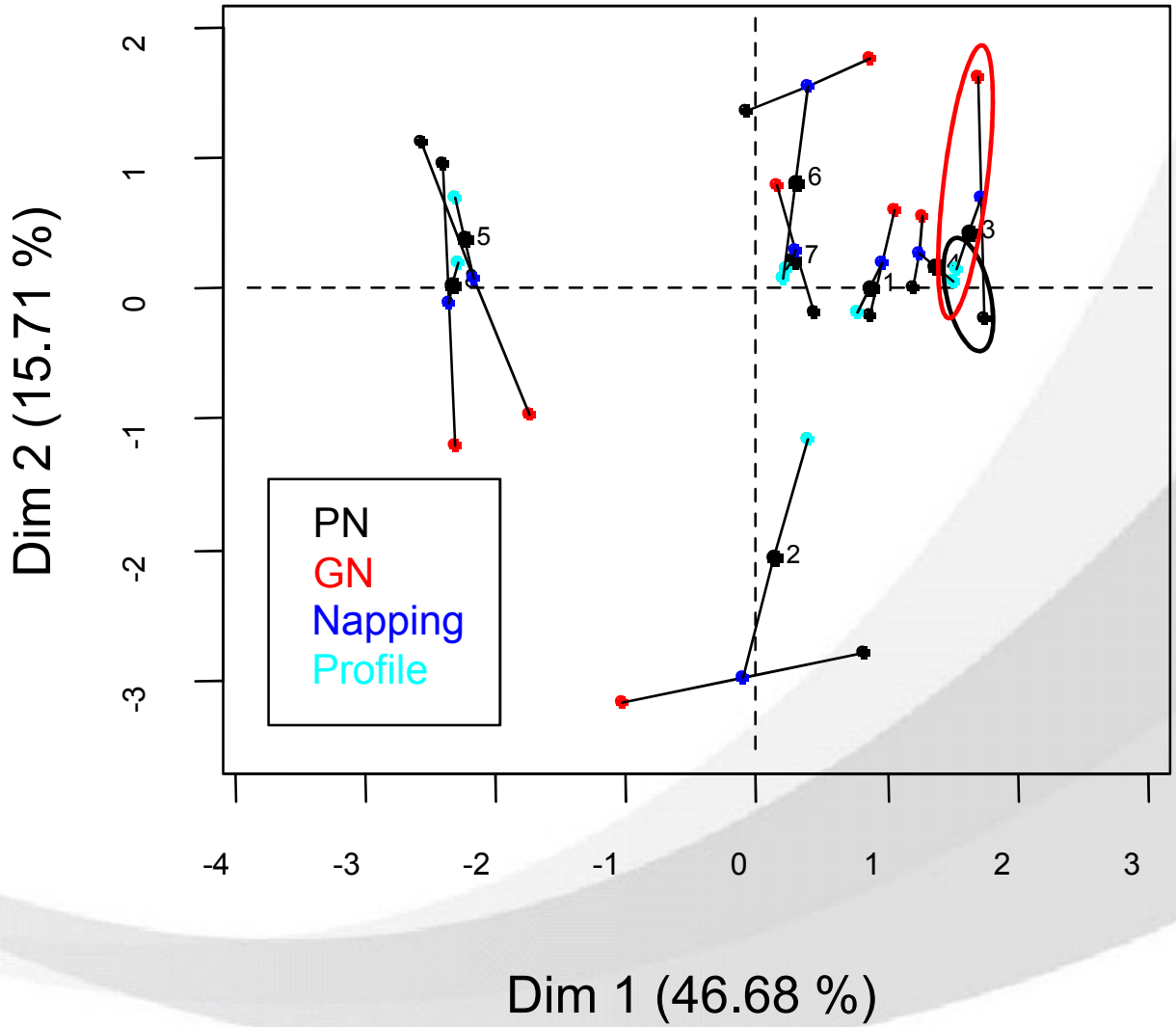
# HMFA results:
# Comparison of product maps

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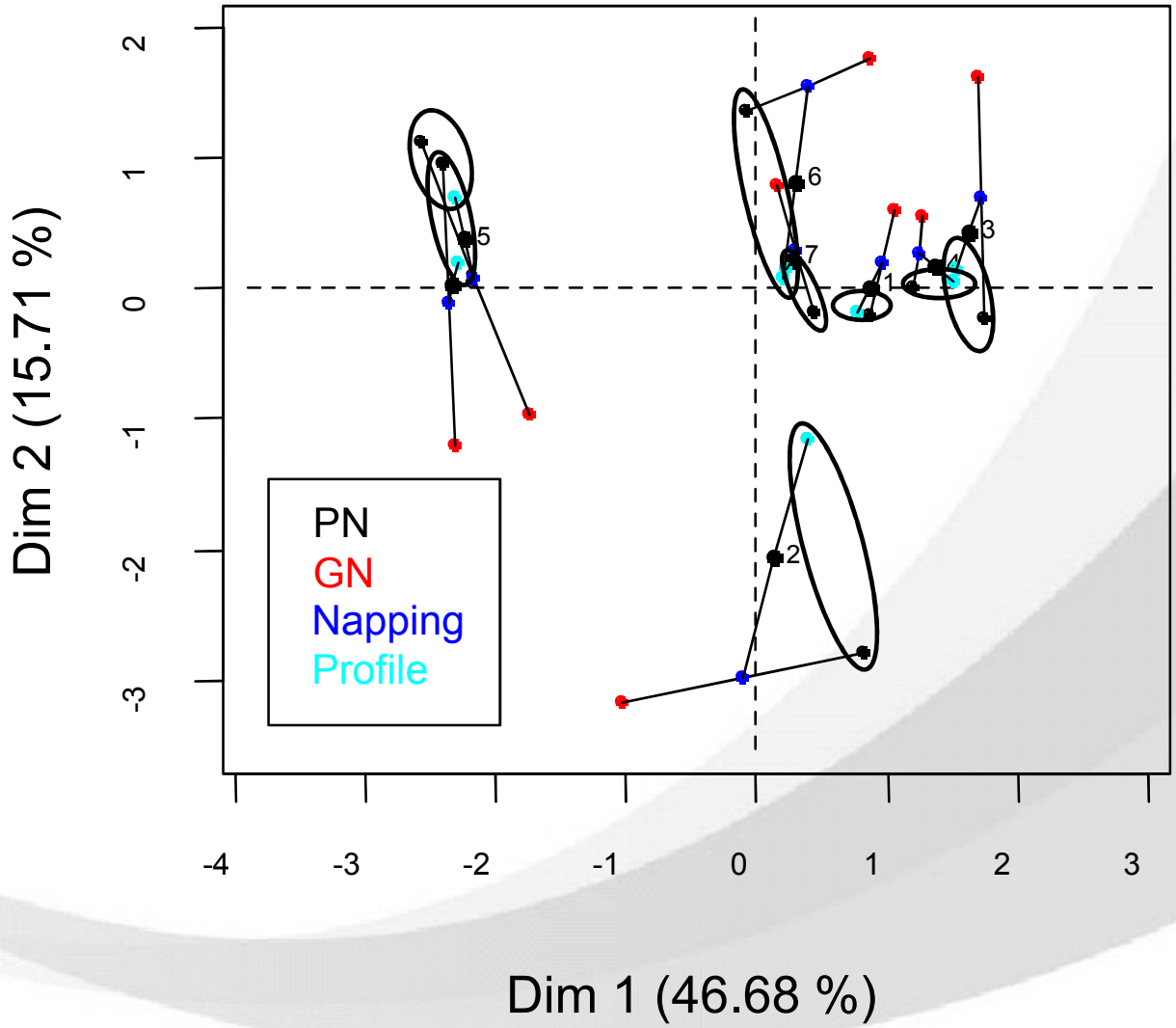
# HMFA results: Comparison of product maps

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# Results:
# RV coefficients

| Profiling vs... | RV | NRV | *p*-value |
|---|---|---|---|
| Partial Napping | 0.88 | 4.25 | 0.003 |
| Global Napping | 0.67 | 2.67 | 0.012 |

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# Results: Attribute generation

- Profiling: 23 attributes (defined and agreed upon)
- Attributes from Global Napping:
  - 20 terms
  - Main characteristics, overall apparent differences
- Attributes from Partial Napping:
  - Terms generated separately for each modality
  - 60 terms generated
  - More detailed descriptions
  - Better interpretation of the product maps
  - Easier for assessors
- Drawback for both Napping methods: no exact meaning of the descriptors.

# Example of attributes
# Partial Napping vs Global Napping

- Texture attributes used:

| Global Napping | Partial Napping |
|---|---|
| runny | astringent |
| | chewy fruits |
| | creamy |
| | fruits |
| | gluey |
| | gritty seeds |
| | large fruits |
| | mouthcoating |
| | powdery |
| | RoB quick |
| | slimy |
| | smooth |
| | thick |
| | thin |

# Conclusions

- Partial Napping allowed the panellist to be more analytical in their approach by focusing on each sensory dimension separately.
- Attributes generated during the Partial Napping sessions were more descriptive and allowed for easier interpretation of results.
- The sample space from Partial Napping was closer to the space derived from descriptive profiling, compared to Global Napping.
  - This may be dependent on the product category; further studies are underway to validate these results.
- Panellists found both the sample placement and the sample descriptions easier for the Partial Napping technique.

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# Thank you for your attention!

## Questions?

**Contact details:**

c.gilbert@campden.co.uk

+44 (0)1386 842256

www.campden.co.uk



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