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

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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.

Pfeiffer & Gilbert*, Sensometrics 2008
Introduction to Partial Napping (or Napping by modality)

- 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

**Napping**
- Holistic
- Synthesises all product characteristics

**Partial Napping**
‘Happy medium’

**Profiling**
- Analytical
- Assesses each attribute separately

Pfeiffer & Gilbert*, Sensometrics 2008
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

Pfeiffer & Gilbert*, Sensometrics 2008
Results
Global Napping - MFA

Partial Napping - HMFA

Profiling - PCA

Dim 1 (39.41 %)

Dimension 2 (10.53%)

Dim 1 (41.12 %)

Dim 2 (17.39 %)

Dim 1 (41.12 %)

Dim 2 (17.9 %)

Dim 1 (78.67%)

Pfeiffer & Gilbert*, Sensometrics 2008

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HMFA results:
Comparison of product maps

Dim 2 (15.71 %)

Dim 1 (46.68 %)

PN
GN
Napping
Profile

Pfeiffer & Gilbert*, Sensometrics 2008
HMFA results: Comparison of product maps

Pfeiffer & Gilbert*, Sensometrics 2008
### Results:
**RV coefficients**

<table>
<thead>
<tr>
<th>Profiling vs...</th>
<th>RV</th>
<th>NRV</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Napping</td>
<td>0.88</td>
<td>4.25</td>
<td>0.003</td>
</tr>
<tr>
<td>Global Napping</td>
<td>0.67</td>
<td>2.67</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Pfeiffer & Gilbert*, Sensometrics 2008
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.

Pfeiffer & Gilbert*, Sensometrics 2008
Example of attributes
Partial Napping vs Global Napping

- Texture attributes used:

<table>
<thead>
<tr>
<th></th>
<th>Global Napping</th>
<th>Partial Napping</th>
</tr>
</thead>
<tbody>
<tr>
<td>runny</td>
<td></td>
<td>astringent</td>
</tr>
<tr>
<td>chewy fruits</td>
<td></td>
<td>gritty seeds</td>
</tr>
<tr>
<td>creamy</td>
<td></td>
<td>large fruits</td>
</tr>
<tr>
<td>fruits</td>
<td></td>
<td>mouthcoating</td>
</tr>
<tr>
<td>gluey</td>
<td></td>
<td>powdery</td>
</tr>
<tr>
<td>gritty seeds</td>
<td></td>
<td>RoB quick</td>
</tr>
<tr>
<td>large fruits</td>
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<td>slimy</td>
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<tr>
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<td>smooth</td>
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<tr>
<td>RoB quick</td>
<td></td>
<td>thin</td>
</tr>
</tbody>
</table>

Pfeiffer & Gilbert*, Sensometrics 2008
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.
Acknowledgement

Thank you to François Husson, Lucie Perrin, Sébastien Lê and Jérôme Pagès for their support with SensoMineR and FactoMineR software.
References


Thank you for your attention!

Questions?

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