Characterization and perceptual mapping of luxury women’s fragrances using sorting, projective mapping, and conventional descriptive analysis

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Sorting

• Widely used in the psychology field
• Stimuli are sorted based on their similarity.
• Number of groups > 1 and < number of stimuli
• Cost and time efficient method
• Data are analyzed by multidimensional scaling or multiple factor analysis.
Sorting
Sorting

Group 1: bitter, relaxing

Group 2: carbonated, sweet

Group 3: sweet, refreshing
Projective Mapping (PM)

- Adapted from projective techniques used in qualitative market research
- Stimuli are placed on the space based on their similarity and dissimilarity.
- Data are analyzed by multiple factor analysis or generalized procrustes analysis.
- RV coefficients are used to understand the correlation between the consensus space.
Projective Mapping
Projective Mapping

- sweet, carbonated
- herbal, bitter
- bitter, relaxing
- refreshing, sweet
Projective Mapping
Objectives

To determine if perceptual mapping techniques are useful in understanding sensory characteristics of fragrances compared to the conventional descriptive analysis.

To compare the results of perceptual mapping obtained from descriptive and consumer panels.

To access consumer reproducibility of perceptual mapping tasks.
**Stimuli**

<table>
<thead>
<tr>
<th>Perfume Name</th>
<th>Type*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angel</td>
<td>EP</td>
</tr>
<tr>
<td>Aromatics Elixir</td>
<td>EP</td>
</tr>
<tr>
<td>Chanel N 5</td>
<td>EP</td>
</tr>
<tr>
<td>Cinéma</td>
<td>EP</td>
</tr>
<tr>
<td>Coco Mademoiselle</td>
<td>EP</td>
</tr>
<tr>
<td>L’Instant de Guerlain</td>
<td>EP</td>
</tr>
<tr>
<td>J’Adore</td>
<td>EP</td>
</tr>
<tr>
<td>J’Adore ET</td>
<td>ET</td>
</tr>
<tr>
<td>Lolita Lempicka</td>
<td>EP</td>
</tr>
<tr>
<td>Pleasures</td>
<td>EP</td>
</tr>
<tr>
<td>Pure Poison**</td>
<td>EP</td>
</tr>
<tr>
<td>Shalimar**</td>
<td>ET</td>
</tr>
</tbody>
</table>

* EP stands for Eau de Parfum
* ET stands for Eau de Toilette
** represents duplicate samples used in consumer perceptual mapping study
Sample Preparation
Sample Preparation
Assessors

- Descriptive panelists (n=12)
  - sorting/projective mapping
  - conventional descriptive analysis (3 replications)
- Fragrance users (n=117)
  - women
  - age ranged from 25-55
  - use perfume at least 2-4 times a week
  - have no discomforts in using fragrances
  - recruited from the Sensory & Consumer Research data base
Sorting Procedures

• Samples simultaneously presented
• Sort samples based on the similarity
• Name each group of sample based on their sensory characteristics
Projective Mapping Procedures

- Samples simultaneously presented
- Place samples in the space (white paper)
- Mark an X on the paper to identify sample location
- Add terms on the paper to describe samples
MFA Results Comparing the 3 Methods using ‘Descriptive Panelists’

**Dim 1 (25.68 %)**

- Sorting
- Projective Mapping
- Descriptive Analysis

**Dim 2 (12.97 %)**

- Citrus
- Grapefruit
- Citral
- Other Citrus
- Fruity Non-Citrus
- Other Fruity
- Green Grassy/Unripe
- Floral
- Jasmine
- Ylang Ylang
- Rose
- Other Floral
- Sweet Aromatics
- Vanilla
- Aldehyde/Soapy
- Woody
- Spicy
- Piney/Terpery
- Earthy/Musty/Dirty
- Animal
- Musk
- Other Spicy
- Powdery

**RV coefficients:**
- Sorting vs. PM = 0.67
- Sorting vs. DA = 0.63
- PM vs. DA = 0.69
MFA Results Comparing the 3 Methods using ‘Fragrance Users’

RV coefficients: Sorting vs. PM = 0.94
Sorting vs. DA = 0.74
PM vs. DA = 0.84
Sorting Results – Descriptive Panel

Stress Value = 0.15
Sorting Results – Consumer Panel

Stress Value = 0.19
PM Results – Descriptive Panel
PM Results – Consumer Panel

[Diagram showing various scents and their associations such as Anise, Caramel, Chamomile, Citrus, Clean/Freshness, Earthy, Feminine, Flowery, Fresh Lemon, Fruity, Green, Honey, Jasmine, Leather, Mandarin/Orange, Masculine, Mediciney, Nutty/Almond, Old, Piney, Powder, Rose, Spicy, Strong, Sweet, Sweet Fruit/Melon, Vanilla, Woody, etc.}
Conventional Descriptive Analysis Results

- Conventional Descriptive Analysis Results
  - Overall Intensity
    - Citrus
      - Lemon
        - Citral
      - Other Citrus
    - Fruity - Non Citrus
    - Green Grassy/Unripe
    - Floral
      - Jasmine
      - Ylang Ylang
      - Rose
    - Spicy
      - Other Spicy
      - Spicy/Musky/Woody
    - Piney/Terpeny
    - Sweet Aromatics
      - Vanilla
    - Powdery/Vanilla
    - Medicinal
      - Aldehyde/Soapy
      - Woody
      - Earthy/Musty/Dirty
      - Medicinal
      - Overall Intensity
    - Animal
      - Musk
      - Ylang Ylang
      - Green/Lemony
      - Powdery/Vanilla
      - Medicinal/Musty/Dirty
Conclusions

- Configurations of these three techniques were similar for both panels. However, projective mapping showed higher agreement with descriptive analysis than sorting.
- Consumers showed reproducibility in performing perceptual mapping tasks.
- Perceptual mapping was effective as an exploratory sensory technique for screening a large number of products.
- The experimenter should have the option of using naïve consumers rather than descriptive panelists in understanding product sensory characteristics.
Thank you.
For further information, please visit poster #35.