Preference Mapping and Consumer Based Target Products

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by
Carr Consulting
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Why Use Preference Mapping

- **Study the competitive set of products.**
  - Understand the current distribution of products.
  - Compare your products & prototypes to the competition.
  - ID holes on the map where no product currently exists.

- **Study key drivers of liking and image**
  - ID the product characteristics that drive acceptance.
  - Understand how sensory and instrumental properties affect the image your products convey to consumers.
  - ID ideal points and proximity of your products to the ideal(s).
  - Focus future product improvement efforts on the areas that will have the greatest impact.
Three Types of Preference Maps

- **Internal Preference Mapping:**
  - Locate products on the map based on consumer acceptance.

- **External Preference Mapping:**
  - Locate products on the map based on sensory or instrumental measures.

- **Partial Least Squares (PLS) Mapping:**
  - Locate products on the map based on both consumer and sensory/instrumental measures.
External Preference Mapping

- Products
  - Sensory & Instrumental
    - Profiles
      - Perceptual Map from PCA
  - Consumer
    - Acceptance & Image
      - Consumer Segments from Cluster Analysis

Preference Map Linking Acceptance to Sensory by Regression
External Preference Mapping

- Products
- Sensory & Instrumental
- Profiles
- Perceptual Map from PCA
- Preference Map Linking Acceptance to Sensory by Regression

Acceptance & Image
Consumer Segments from Cluster Analysis

Consumer
Perceptual Mapping

◆ A statistical technique for summarizing sensory descriptive evaluations of products.
  – Groups large numbers of attributes onto a small number of key sensory dimensions based on correlations.
  – Explains maximum amount of sensory variability with fewest number of dimensions.
  – Dimensions are mutually independent, offering the greatest potential for controlling specific groups of attributes while leaving others unchanged.
Perceptual Map of Wieners

Same data as Dr. Findlay presented in the previous talk.
Key Sensory Dimension

- Five key sensory dimensions explain 93% of total variability in sensory attributes
  - “Springy to Juicy/Pepper/Skin” 46% of Total
  - “Green Herbs” 15% of Total
  - “Pork & Garlic” 13% of Total
  - “Smokey Flavor” 11% of Total
  - “Sour” 8% of Total
Dimensions Can Be Covered Uniformly or Defined by A Single Product

Uniform Coverage

Single-Sample Dimension

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Two-Dimensional Maps Add Insights

Wieners PCA Map

Springy to Juicy/Pepper/Skin (46%)

Green Herbs (15%)

Smoky (11%)

Pork & Garlic (13%)

Sample

Sensory

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Identifying Preference Segments
External Preference Mapping

- **Products**
  - Sensory & Instrumental
    - Profiles
    - Perceptual Map from PCA
  - Preference Map Linking Acceptance to Sensory by Regression
  - Acceptance & Image
    - Consumer Segments from Cluster Analysis
  - Consumer
Identifying Preference Segments

- Consumers have diverse preferences.
- Avoid developing products for the nonexistent, “average” consumer.
- Identify groups of consumers with similar preferences before developing preference maps.
  - Use Cluster Analysis to group respondents with similar preferences.
Cluster Analysis Identifies How Many Segments Exist

Cluster Analysis of Wiener Data

Judge

Similarity

-336.19

-190.79

-45.40

100.00
Average Liking Ratings ID How the Preference Segments Differ.

Wiener Study Overall Liking by Preference Segment

<table>
<thead>
<tr>
<th>Preference Segment</th>
<th>Overall Liking</th>
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</thead>
<tbody>
<tr>
<td>P14</td>
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<tr>
<td>P2</td>
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<td>P1</td>
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<td>P7</td>
<td>3.7</td>
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</table>

Seg1 (n=61) | Seg2 (n=51) | Total (n=112)
Preference Mapping
External Preference Mapping

Preference Map Linking Acceptance to Sensory by Regression

Products

Profiles

Perceptual Map from PCA

Sensory & Instrumental

Acceptance & Image

Consumer Segments from Cluster Analysis

Consumer
From Perceptual Map to Preference Map

- Easy-to-understand graphical techniques for illustrating how sensory and instrumental properties relate to consumer acceptance and perceptions of product image.
  - Use regression equations link the sensory and instrumental information to consumer ratings.
    - Coordinates from perceptual map are the predictor variables.
    - Acceptance image ratings are the dependent variables.
What Characteristics Drive Liking?

◆ **Segment 1 wants:**
  - Top Tier
    » Medium level of “Green Herbs” (B)
    » Low level of “Sour” (E)
    » Mid-High levels of “Pork/Garlic” (C)
  - Second Tier
    » High “Springiness” (A)
    ◆ Low “Juicy/Pepper/Skin”
  - Any level of “Smoke” is acceptable to Segment 1
What Characteristics Drive Liking?

◆ **Segment 2 wants:**
  - Top Tier:
    » Medium level of “Smoke” (D)
  - Second Tier:
    » Low level of “Sour” (E)
    » Low level of “Pork/Garlic” (C)
  - Third Tier:
    » Low “Green Herbs” (B)
  - Any level of “Springy to Juicy/Pepper/Skin” is acceptable to Segment 2
Where are the Target Products?

Green Herbs (15%)  
- Sample  ■ Sensory

Area of Opportunity

Pork/Garlic (13%)
Segments Have Different Target Products

◆ Business Decisions
  – Single or Multiple Product Line?
  – Which Segment should be targeted?
  – People? Regionality? Image?
    » Look at demographics and A&U.

◆ Technical Decision
  – What product(s) should I make?
  – How do I confirm that I have made it?
    – Reverse Engineer the Target Product.
Reverse Engineering to a Target Product
Target Profiles Provide Product Development Guidance

- Identify sensory profile of Target Products using Reverse Engineering
- Learn how close your products are to the Targets without having to go back to the consumer after each round of reformulations.
- Differences among segments are evident in the Target Profiles.

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<thead>
<tr>
<th>Sensory Attribute</th>
<th>Seg1 Target Profile</th>
<th>Seg2 Target Profile</th>
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<td>Juicy</td>
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<td>Residual Oil</td>
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<td>Skin Chew</td>
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<td>Firm Skin</td>
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Clear Direction on Product Improvements

◆ Compare your product to the Target to prioritize improvement efforts.

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Conclusions

- Preference Mapping is a powerful tool for understanding consumer preferences and for identifying product improvement opportunities.
- Leverages learnings from Perceptual Maps.
- Preference Segments provide more practical view of consumer opinions.
- Provides deeper and longer lasting insights than traditional “beauty contest” consumer tests.