



**Statistics Seminar**  
April 22, 2010



***Successful Product  
Development using a Consumer  
Perspective***

**Presented By:**  
**John M. Ennis**

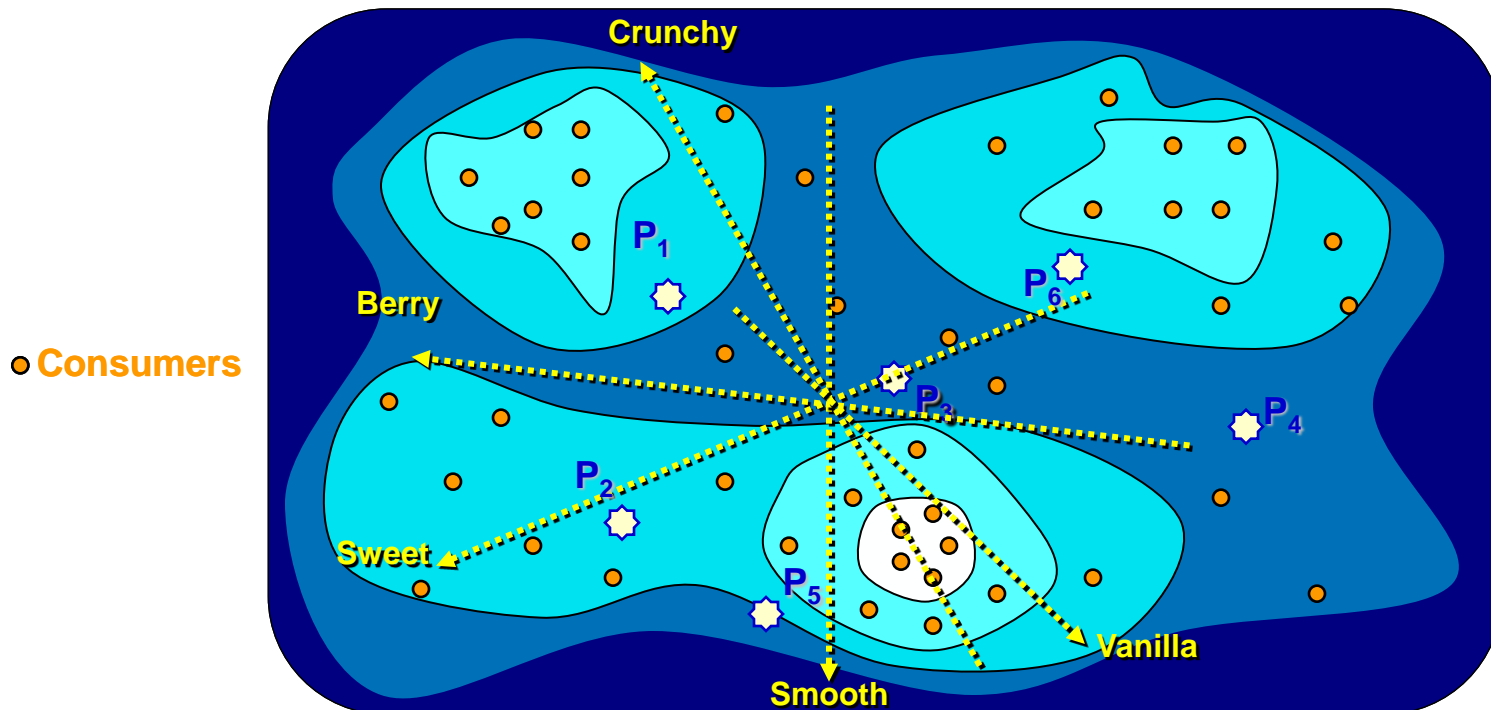
***The Institute for Perception***

**E-mail: [john.m.ennis@ifpress.com](mailto:john.m.ennis@ifpress.com)**

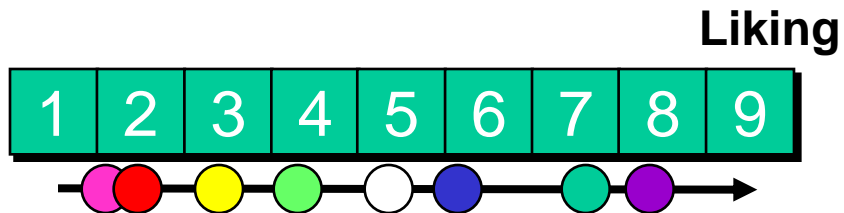
**Phone: (804) 675 2980**

# Landscape Segmentation Analysis

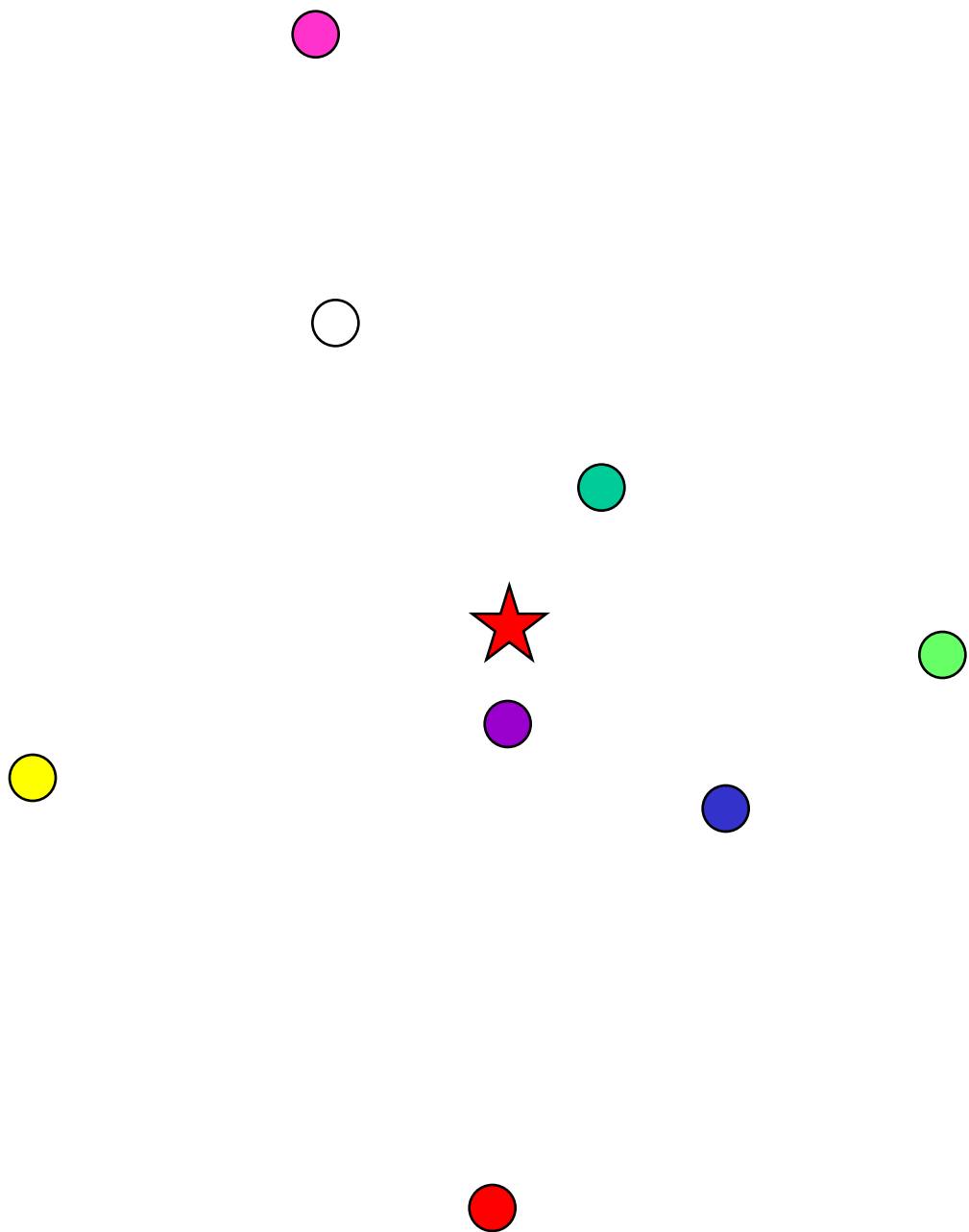
- ❖ LSA first “unfolds” liking and creates a space relevant to consumer acceptability
  - ❖ *The closer a consumer is to a product, the more he/she likes it*
- ❖ Descriptive data is then added by regressing the attributes on the map
  - ❖ *Some attributes can be fit on the map and are drivers of liking*
  - ❖ *Others can't and are less relevant to consumer acceptability*
- ❖ Optimum product locations and profiles can also be estimated



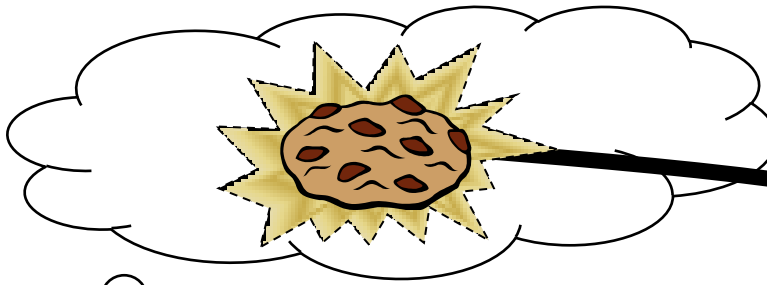
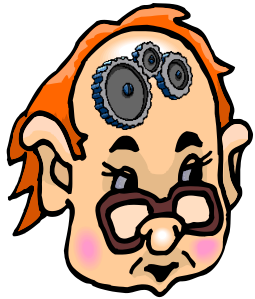
# Unfolding



# Unfolding



# Ideas behind LSA



- Momentary perception
- Momentary ideal



**Dislike  
Extremely**

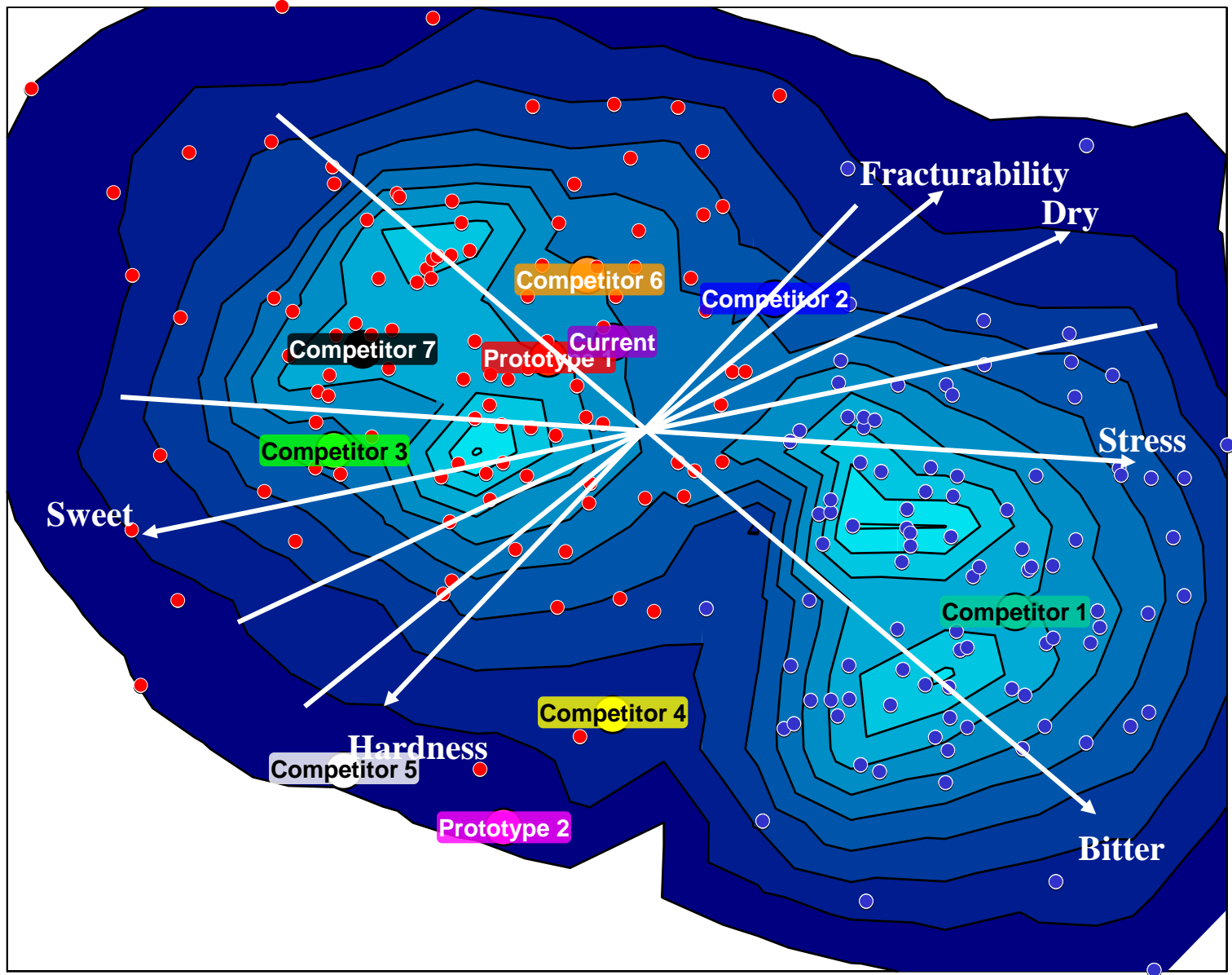
**Neither Like  
Nor dislike**

**Like  
Extremely**

- Similarity varies from 1 ( $n/n$ ,  $n$  = number of categories, identical to ideal) to  $1/n$  (most different from ideal)
- The similarity estimate will be used by the model to optimize:
  - ❖ Product locations
  - ❖ Product variances
  - ❖ Individual ideal locations
  - ❖ Individual biases



## LSA map generation process





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# Liking of 25 Products





# Liking of 25 Products

- 280 consumers
- 25 beverages
- Liking ratings on 9-point hedonic scale



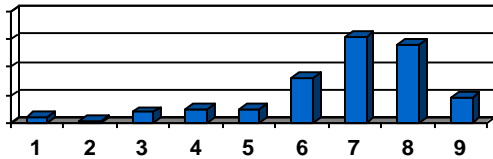
*Dislike  
extremely*

*Neither like  
nor dislike*

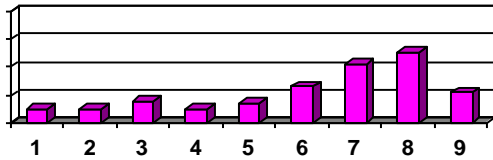
*Like  
extremely*

# 25 Product Liking Distributions

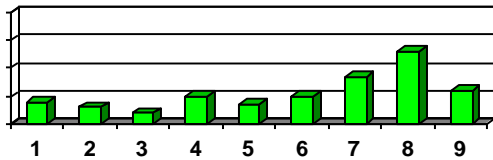
Product 7



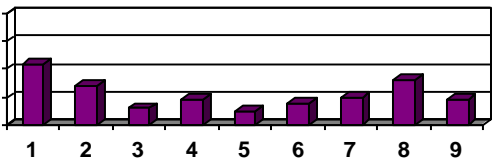
Product 17



Product 18



Product 25



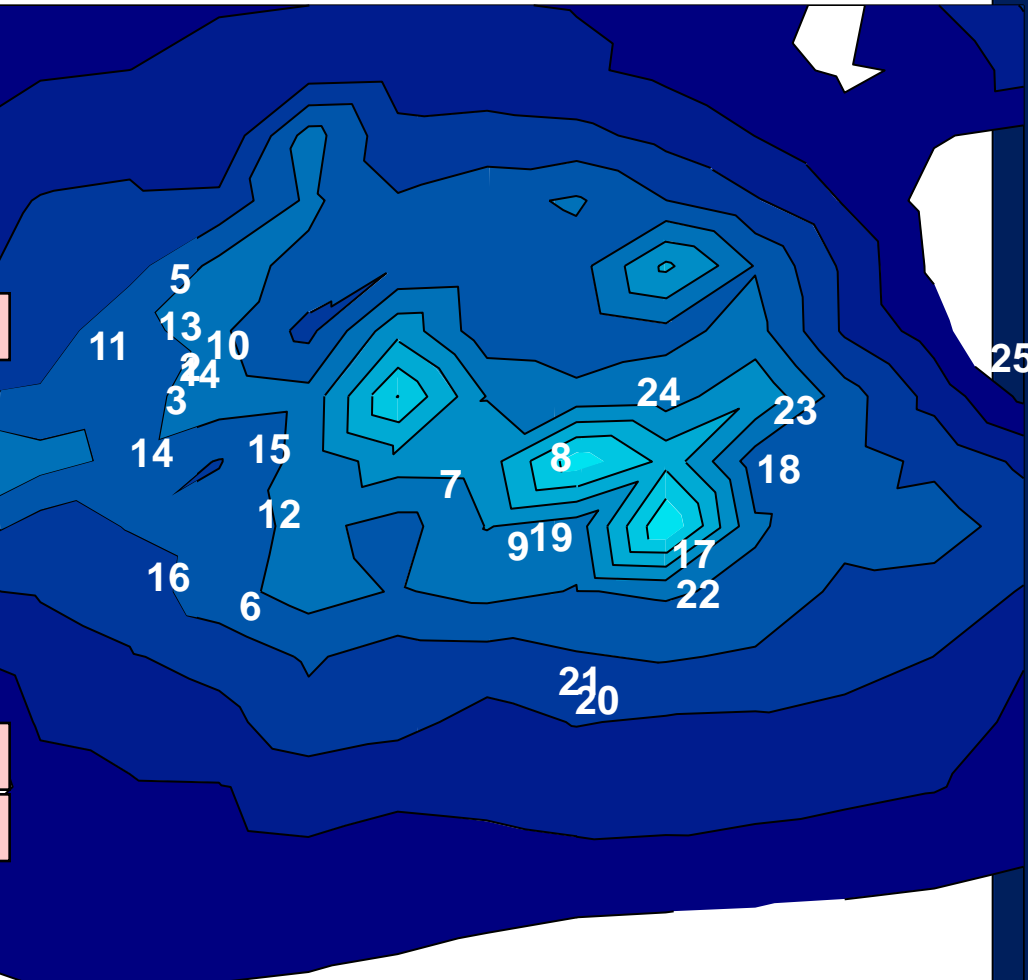
## Ratings

Product	"1"	"2"	"3"	"4"	"5"	"6"	"7"	"8"	"9"	Mean
1	6	12	21	19	32	51	70	48	18	6.03
2	6	9	15	21	35	51	62	53	25	6.20
3	12	10	12	21	35	44	59	46	27	6.07
4	7	4	12	29	41	45	62	66	14	6.18
5	17	19	17	24	34	44	51	57	14	5.69
6	10	10	24	26	26	54	56	51	19	5.91
7	6	2	11	13	15	44	87	77	24	6.72
8	4	10	15	25	27	40	73	57	29	6.33
9	11	14	10	22	22	48	70	61	18	6.14
10	12	19	16	27	33	53	42	56	15	5.74
11	16	27	20	27	38	36	52	46	14	5.44
12	7	11	19	38	25	50	59	42	22	5.90
13	14	23	23	33	31	44	49	46	15	5.49
14	9	15	26	16	30	41	62	49	28	6.00
15	5	12	17	16	28	56	69	52	18	6.16
16	21	26	21	36	27	43	46	42	11	5.84
17	13	14	21	13	20	37	59	68	31	6.21
18	22	17	11	28	19	28	48	72	32	6.01
19	4	6	9	24	22	33	83	67	26	6.56
20	15	25	16	33	19	37	55	55	19	5.69
21	10	11	9	20	14	18	36	45	14	5.96
22	12	20	20	30	14	36	54	62	26	5.93
23	15	22	13	24	33	28	62	51	25	5.84
24	5	27	12	23	30	43	60	58	21	5.98
25	61	37	17	24	15	22	28	45	24	4.62

# LSA Contour Plot

Ratings

Product	"1"	"2"	"3"	"4"	"5"	"6"	"7"	"8"	"9"	Mean
1	6	12	21	19	32	51	70	48	18	6.03
2	6	9	15	21	35	51	62	53	25	6.20
3	12	10	12	21	35	44	59	46	27	6.07
4	7	4	12	29	41	45	62	66	14	6.18
5	17	19	17	24	34	44	51	57	14	5.69
6	10	10	24	26	26	54	56	51	19	5.91
7	6	2	11	13	15	44	87	77	24	6.72
8	4	10	15	25	27	40	73	57	29	6.33
9	11	14	10	22	22	48	70	61	18	6.14
10	12	19	16	27	33	53	42	56	15	5.74
11	16	27	20	27	38	36	52	46	14	5.44
12	7	11	19	38	25	50	59	42	22	5.90
13	14	23	23	33	31	44	49	46	15	5.49
14	9	15	26	16	30	41	62	49	28	6.00
15	5	12	17	16	28	56	69	52	18	6.16
16	21	26	21	36	27	43	46	42	31	6.21
17	13	14	21	13	20	37	59	68	32	6.01
18	22	17	11	28	19	28	48	72	26	6.36
19	4	6	9	24	22	33	83	67	26	6.36
20	15	25	16	33	19	37	55	55	19	5.69
21	10	11	9	20	14	18	36	45	14	5.96
22	12	20	20	30	14	36	54	62	26	5.93
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24	5	27	12	23	30	43	60	58	21	5.98
25	61	37	17	24	15	22	28	45	24	4.62





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# **Children and Adults Food Preferences**



# Children and Adult Food Preferences

- Preference and liking for 20 foods by 150 adults and 150 children (8-12 years old)

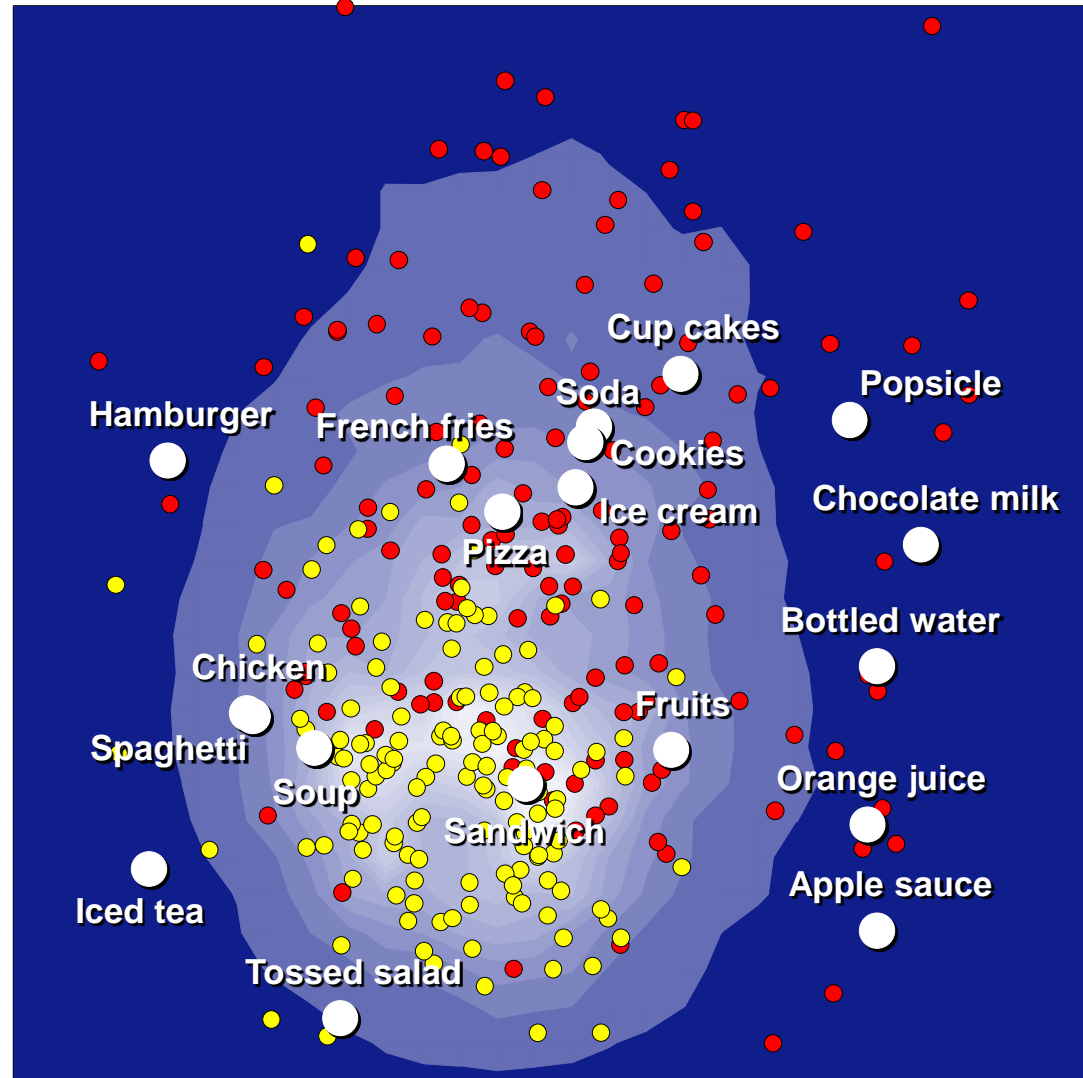
<i>Apple sauce</i>	<i>Chocolate milk</i>	<i>Fruits</i>	<i>Orange juice</i>	<i>Soda</i>
<i>Bottled water</i>	<i>Cookies</i>	<i>Hamburger</i>	<i>Pizza</i>	<i>Soup</i>
<i>Carrot sticks</i>	<i>Cup cakes</i>	<i>Ice cream</i>	<i>Popsicle</i>	<i>Spaghetti</i>
<i>Chicken</i>	<i>French fries</i>	<i>Iced tea</i>	<i>Sandwich</i>	<i>Tossed salad</i>

- Only names given, no actual tasting of the foods
- Adults' liking and preference for foods for their children
- Landscape Segmentation Analysis on liking ratings

# Children and Adult Food Preferences

● Children

● Adults

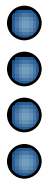




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# Motivations for Product Consumption



# Fruit-Based Beverages with Medicinal Properties

- A company manufactures fruit-based beverages
- Company would like to assess the motivators for product use among a representative sample of consumers
- Six hundred (600) heavy users of the product respond to eight statements dealing with possible motivators

*I drink this product because:*

"I like the flavor"	"I like it"
"It reduces back pain"	"It is healthy for me"
"It is thirst quenching"	"It tastes good"
"It is good for urinary health"	"I like the tangy taste"

*Disagree  
completely*



*Agree  
completely*



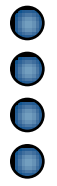




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# Blind/Branded Investigations

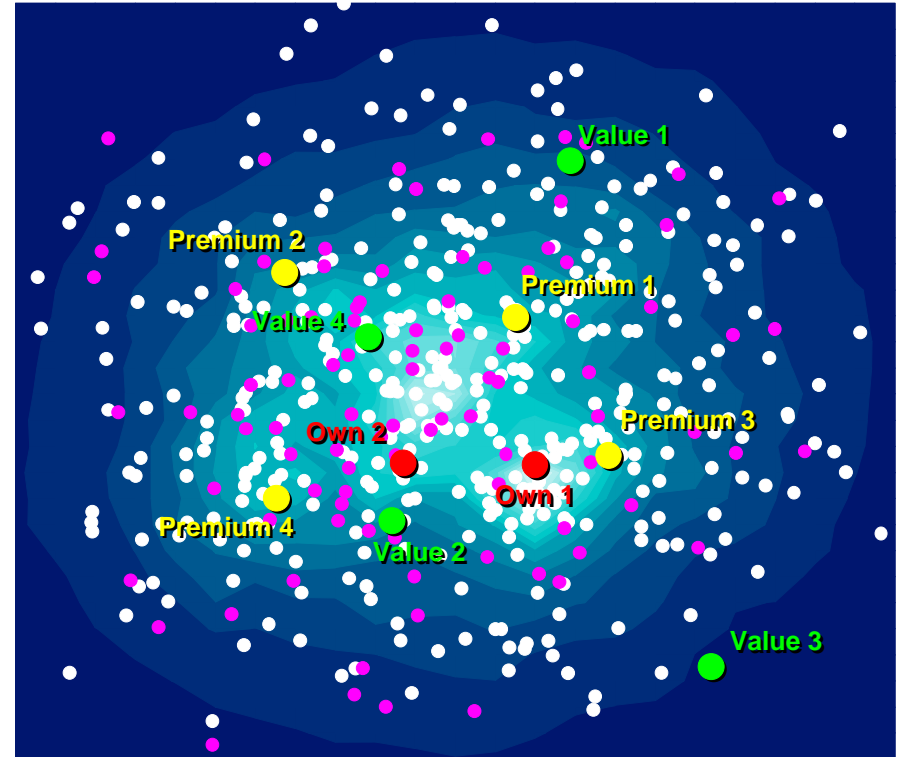
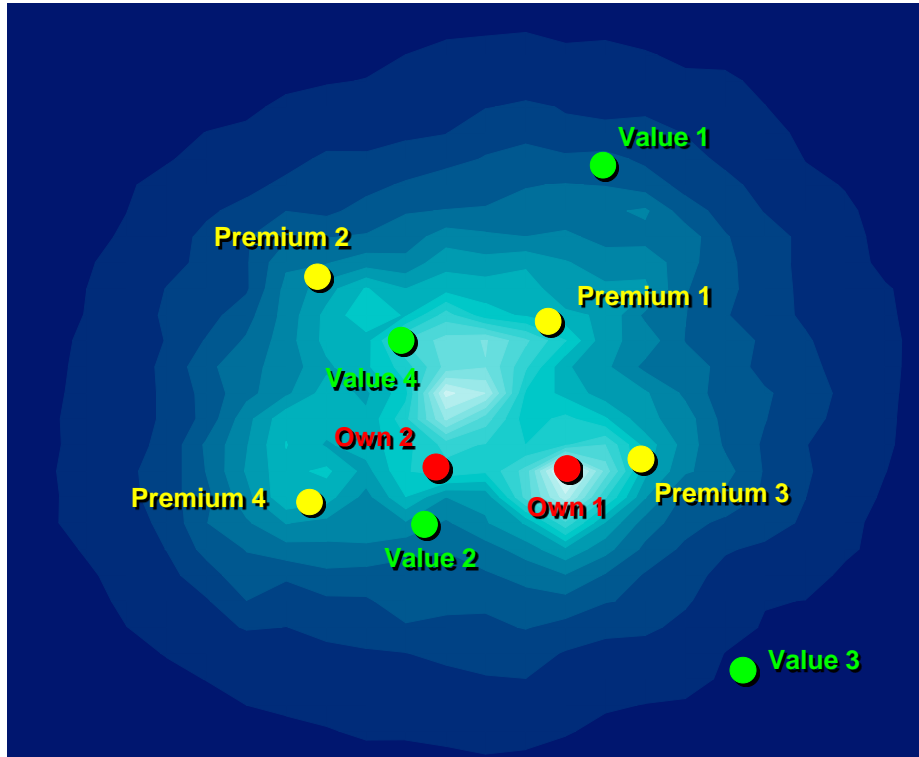


# Blind/Branded Study: Scenario

- Winery wants to introduce new chardonnay wine products in the premium category
- Conducts a study to investigate acceptability of its own products by casual/novice and experienced/knowledgeable wine drinkers
- 10 chardonnay wines:
  - ❖ 4 premium brands
  - ❖ 4 value brands
  - ❖ 2 new products
- 500 consumers
  - ❖ 400 casual/novice wine drinkers
  - ❖ 100 experienced/knowledgeable wine drinkers



# Blind/Branded Study: Blind Evaluation

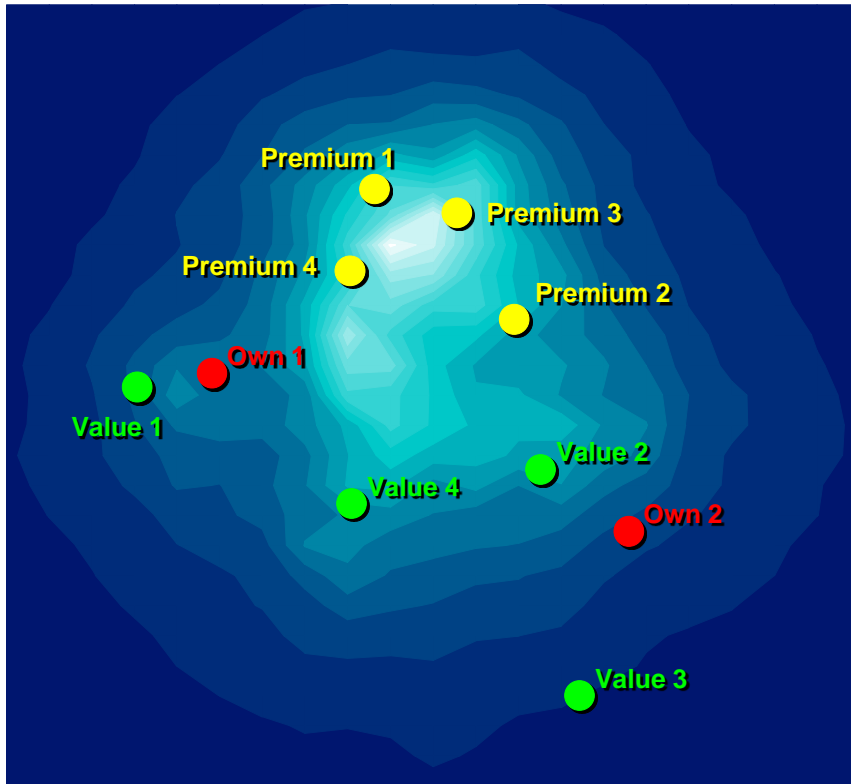


- No segmentation is visible
- Own products well accepted
- Some value products well accepted also

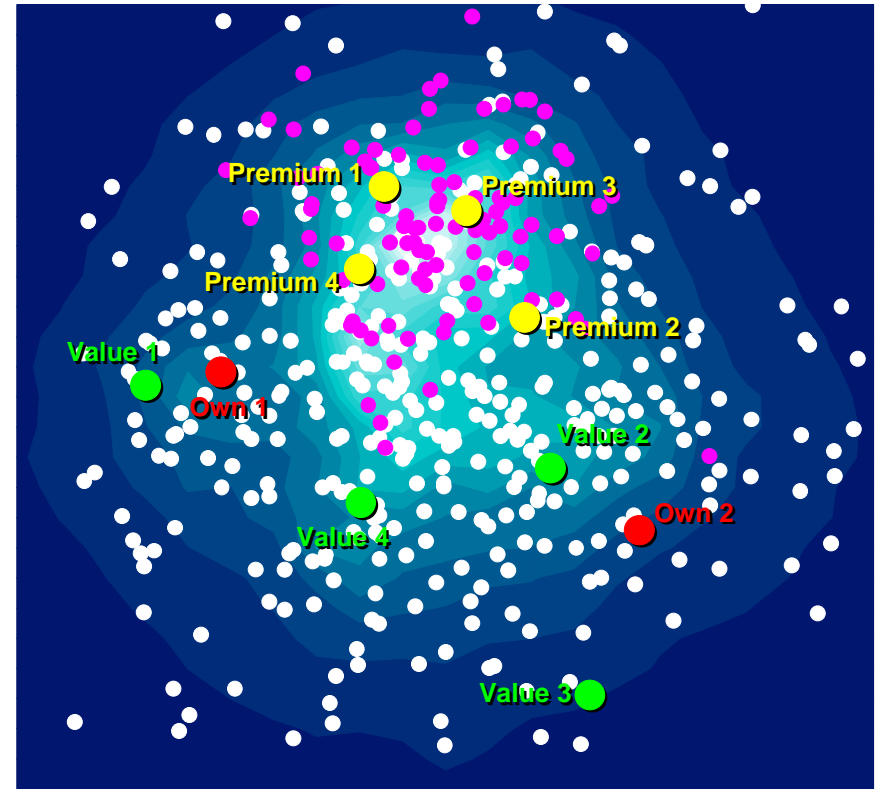
● Casual wine drinker ● Experience wine drinker

- Novice and knowledgeable wine drinkers spread throughout the map without any particular structure

# Blind/Branded Study: Branded Evaluation



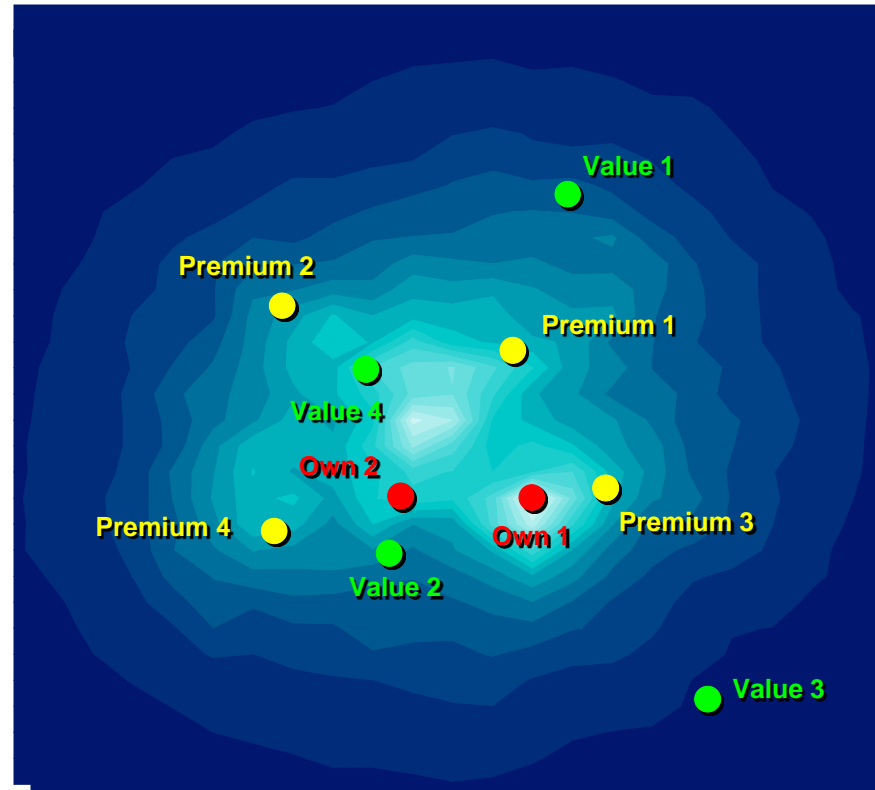
- Little segmentation is visible
- Premium products migrate to the north close to highest consumer density
- Own and value products migrate to the south



● Casual wine drinker    ● Experience wine drinker

- Product migration can be attributed to the high ratings of the knowledgeable consumers for the premium products

# Blind/Branded Study: Blind vs. Branded



- On a blind basis, the company's products perform well over the whole population
- The branded LSA illustrates the power of the brands in this set of 10 products
- Results indicate that the company should focus on improving the products' image rather than their sensory profiles as the latter are close to being optimal



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# Image Appropriateness Study

# Image Appropriateness Study

ASTM International

## Committee E18 on Sensory Evaluation

250 Experts  
More than 30 Standards



Who **INFLUENCES** sensory evaluation standards?  
Who **WRITES** sensory evaluation standards?  
Who **REVISES** sensory evaluation standards?

# YOU CAN!

**JOIN** ASTM Committee E18 **TODAY** and  
be a part of developing important sensory  
evaluation standards. [www.astm.org/JOIN](http://www.astm.org/JOIN)

Industries represented on Committee E18:

- Food
- Personal care
- Household care
- Nutritional goods
- Consumer goods

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# Image Appropriateness Study












## ➤ 11 images:



## ➤ 46 respondents

## ➤ Each respondent rated each picture on a 9-point appropriateness for brochure inclusion scale

# Image Appropriateness Means

Image	Appropriateness Mean
	6.022
	5.717
	5.283
	5.109
	4.870
	4.326
	4.000
	3.891
	3.500
	3.348
	3.348





# Image Appropriateness Conclusions

## ➤ LSA Results:

- ❖ Segmentation visible
  - Laboratory style pictures appealed to one segment of population
  - One segment found few/no pictures appropriate
- ❖ Subject biases generally low

## ➤ Conclusions:

- ❖ A collage of two or three pictures will be needed to cover the space
- ❖ A wider range of pictures is needed for full guidance
- ❖ Chosen pictures were not generally appealing

## ➤ Recommendations:

- ❖ Solicit pictures from membership
- ❖ Re-run study online in near future
- ❖ Use results to select pictures for a collage



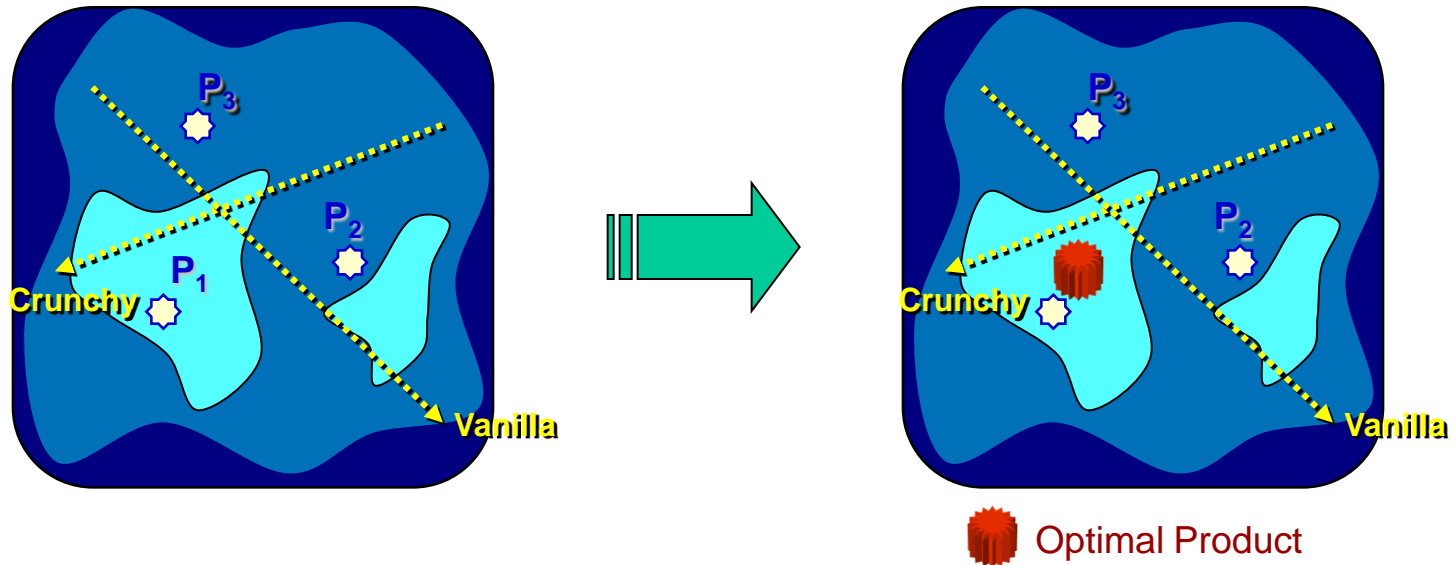
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# Further Capabilities of LSA

# Finding Optima

- An LSA map can be used to estimate locations of optimally placed products

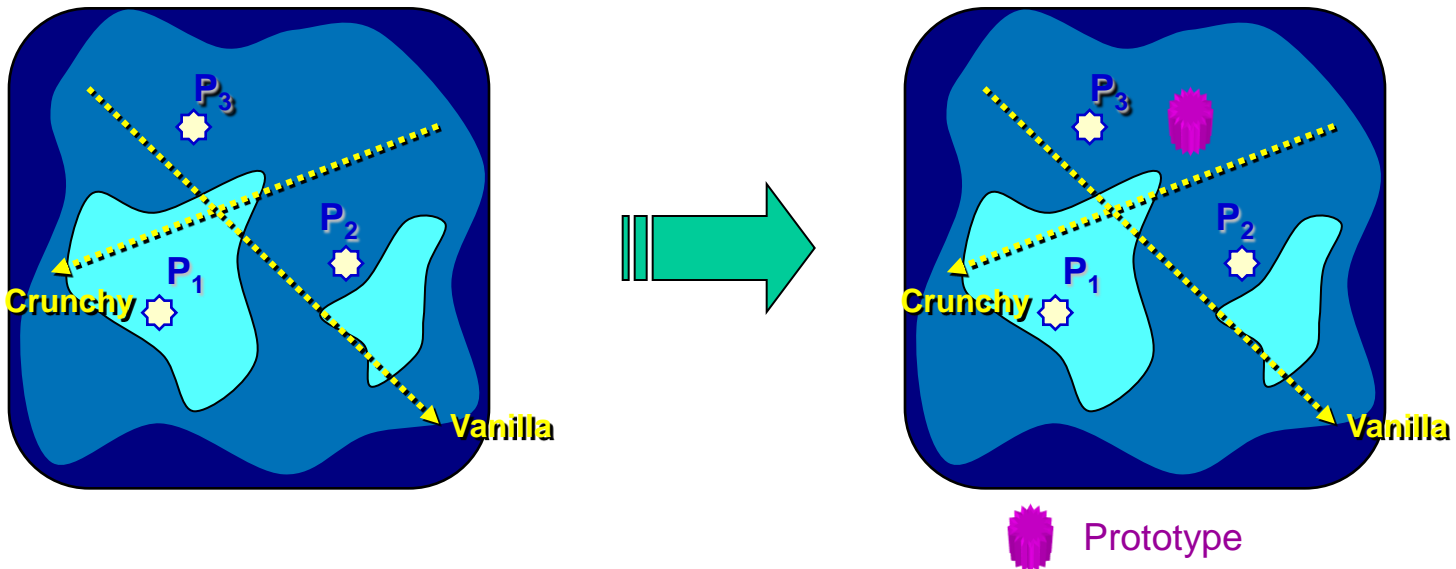


- If scales have been regressed onto an LSA map then product profiles for optima can be generated

# Profile Placement

- Locations of prototypes can also be estimated using the profiles of prototypes on regressed scales

Prototype	Vanilla	Crunchy	...
Prototype 1	3.42	2.67	...
...	...	...	...





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