

江南大学



An Introduction to Descriptive Analysis

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Jiangnan University

Yummy?

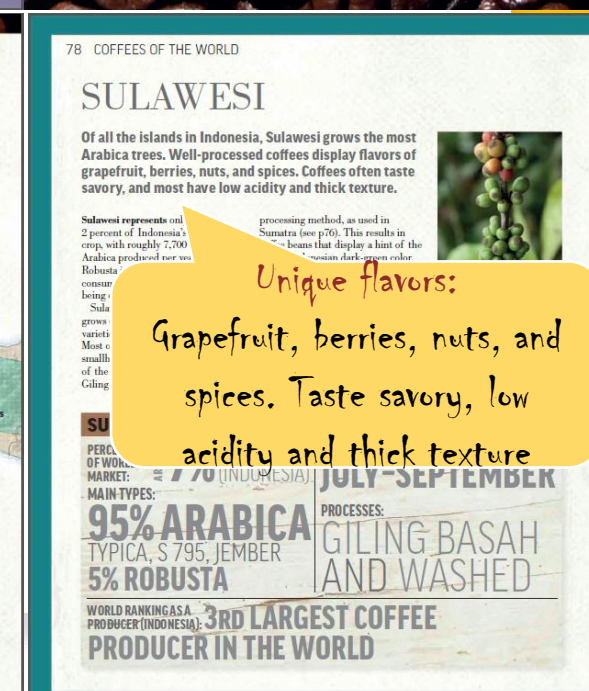
Yucky?



Overrate
or
Underrate

- Sweet?
- Green?
- Creamy?
- Hot?

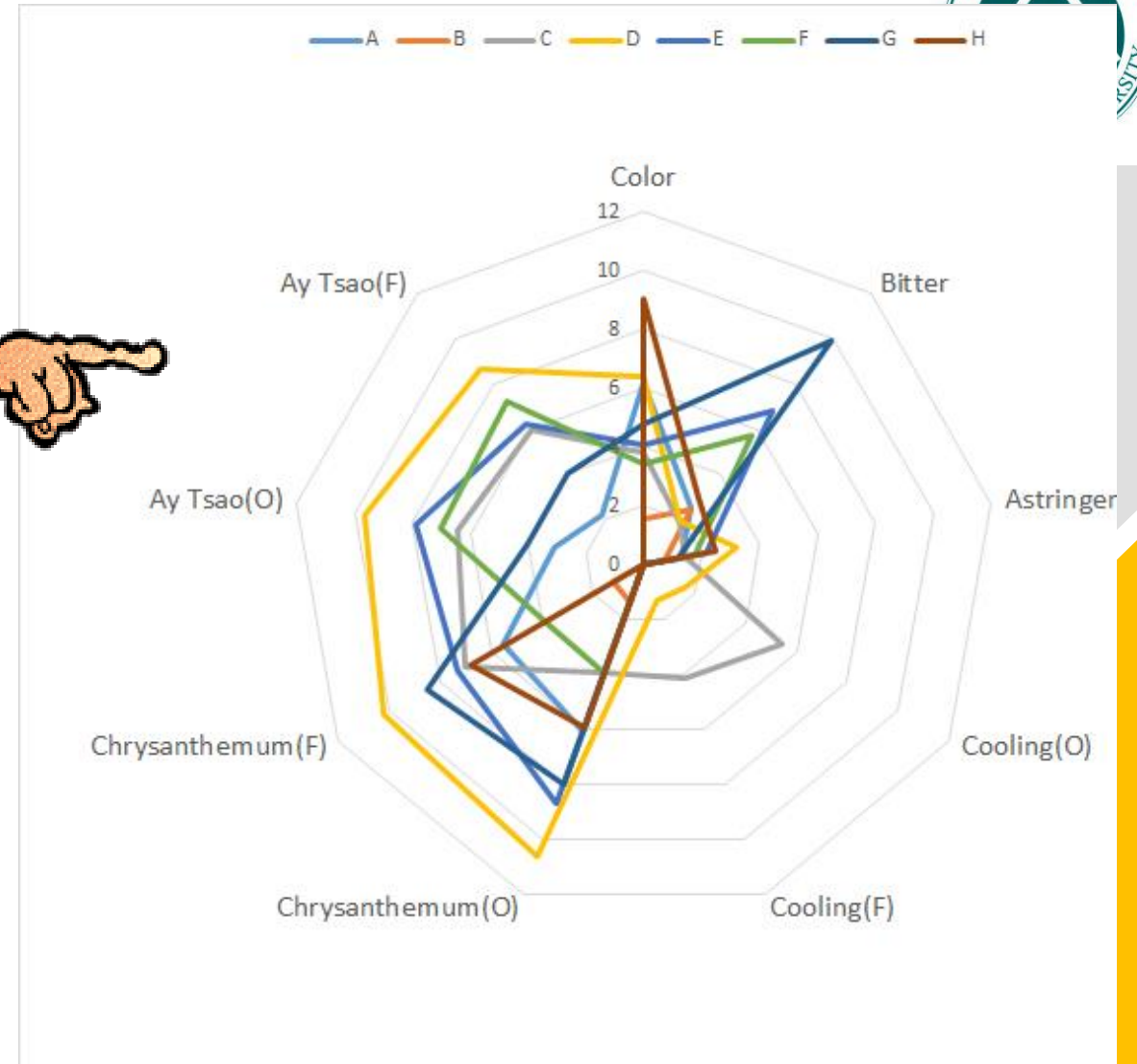




That's why we need DA:

DETAILED SENSORY PROFILES

*So What are the other **benefits**?*



Benefits ? -Examples

- ✓ Advertising claims



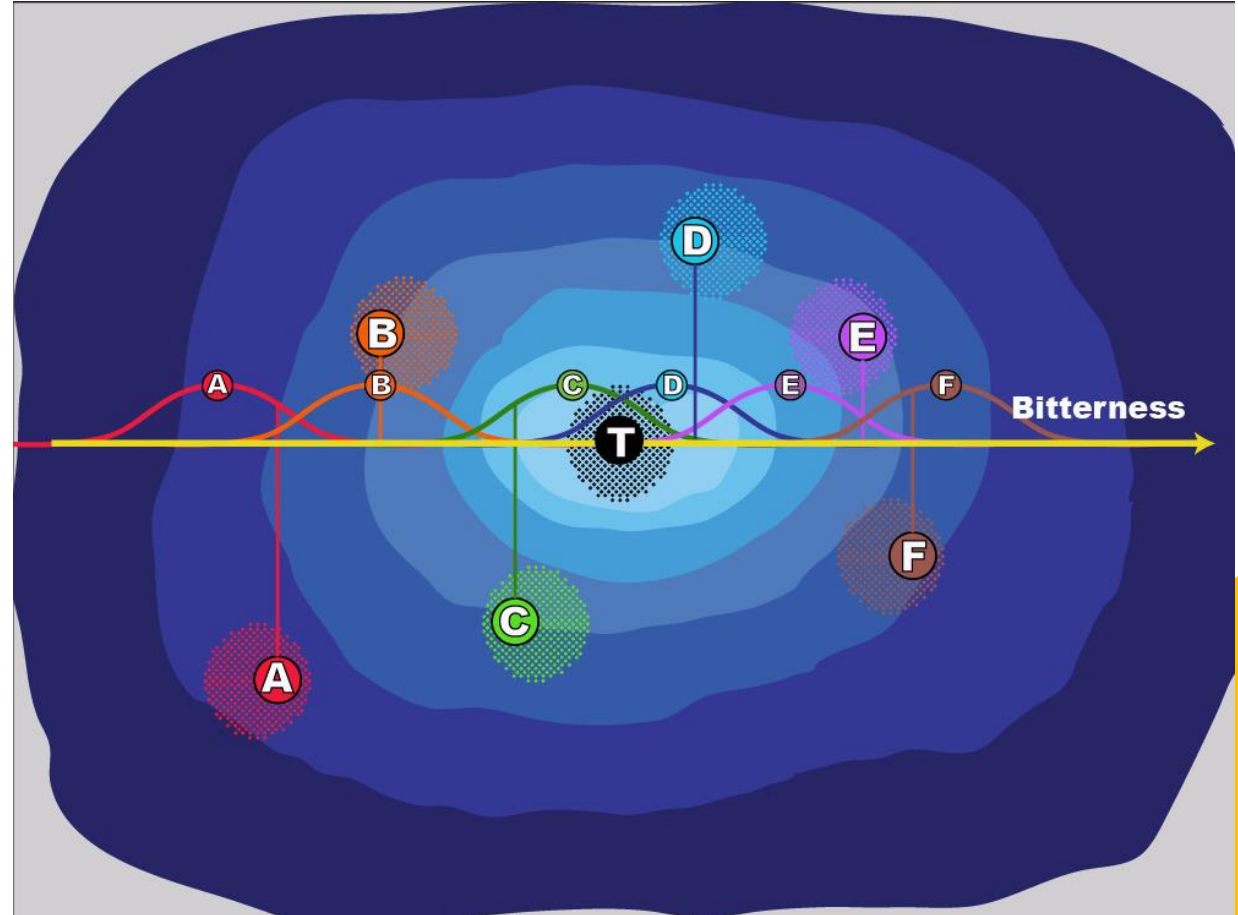
Benefits ? -Examples

- ✓ Set up a control for quality assurance (QA) or quality control (QC)
 - ▣ Define the sensory properties of a control for QA and QC.



Benefits ? -Examples

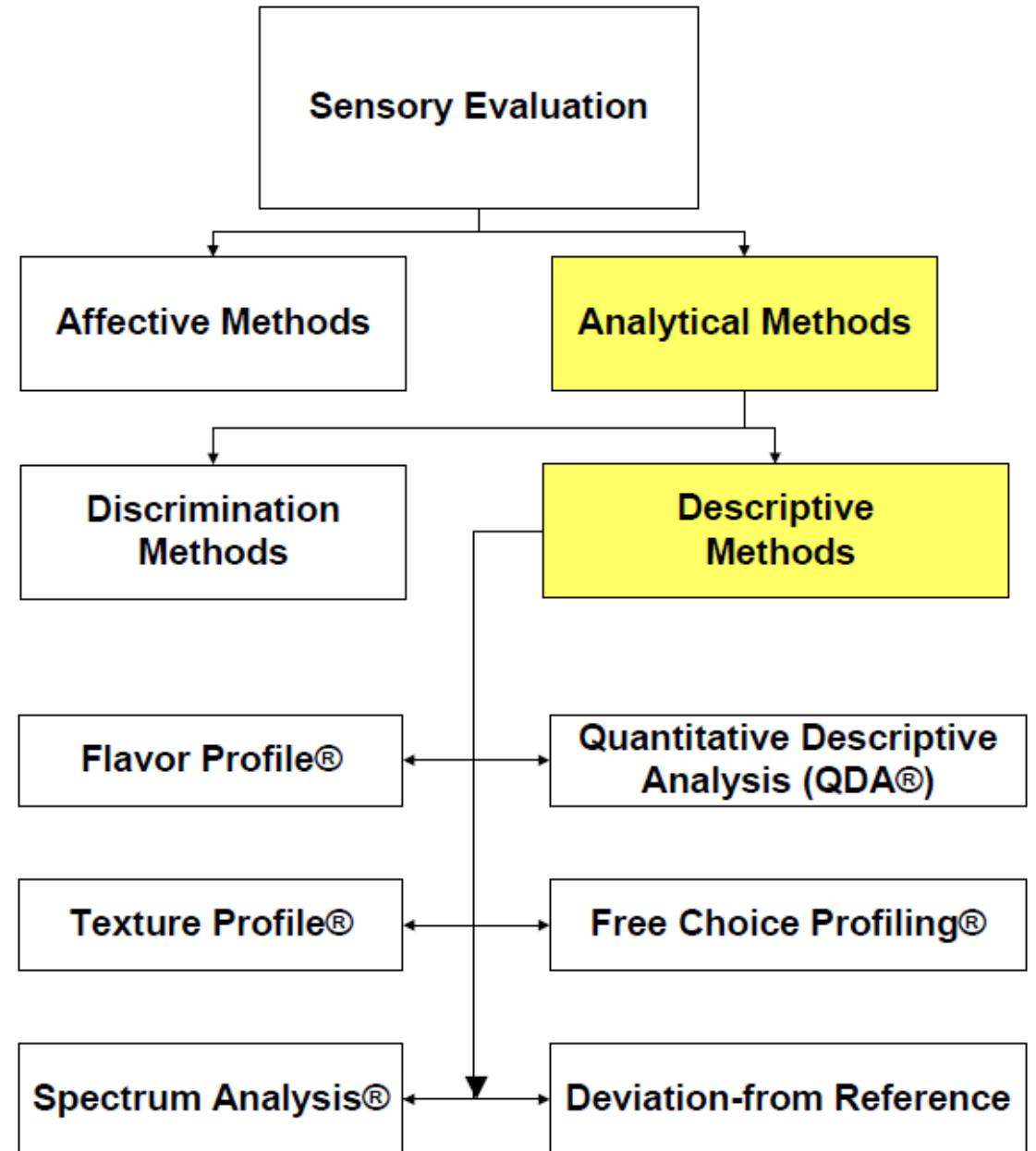
- ✓ Correlate with consumers' liking mapping to elicit the sensory profile of an ideal product



What is Descriptive Analysis?

A type of sensory method that provides product similarities and differences.

Qualitative + Quantitative evaluation



How is that developed?

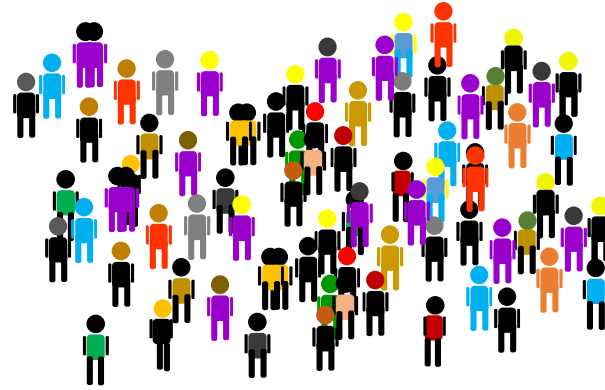


General Procedures

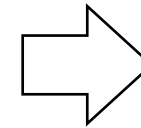
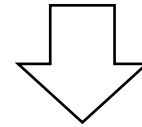
- Recruiting panelists
- Developing an attribute lexicon
- Training panelists
- Validating panelists
- Collecting and analyzing data (actual evaluation)
- Maintaining panelists

Spectrum: as an example

- *Screen* via an online survey
- *Interview* candidates in person
- Panelists' *qualities to look for*:
 - interested in research
 - responsible, mature, and scientific-minded
 - avoid loud and/or dominant personalities ...



Panelists



Spectrum: as an example

- ✓ A basic format for creating a screening mark scheme in Excel

Candidate Name	Basic Taste Tests: 1 = correct						Total Basic Tastes	Discrimination Tests: 1 = correct				Total Discrim' Tests	Odour Description: 3 = exact, 2 = close, 1 = attempt						Odour Matching: 1 = correct						Total Odour Tests	Descriptive Tests	Total Descriptive Tests	Ranking Test: 1 = correct						Total Ranking Tests	Total Score (Max possible =)

Candidate Name	Discrimination Tests: 1 = correct				Total Discrim' Tests	Odour Description: 3 = exact, 2 = close, 1 = attempt				Odour Matching: 1 = correct				Total Odour Tests	Descriptive Test 2 3 = good, 2 = fair, 1 = poor	Total Descriptive Tests	SCORE TOTAL Possible Max Score = 49
	Test 1	Test 2	Test 3	Test 4		Odour 1	Odour 2	Odour 3	Odour 4	Odour 1	Odour 2	Odour 3	Odour 4				
A	1	0	1	0	2	1	3	2	2	1	1	1	1	12	2	3	26
B	1	0	1	1	3	2	2	1	2	1	1	1	1	11	2	5	39
C	0	0	0	0	0	2	2	2	2	1	1	0	1	11	1	3	24
D	0	1	1	1	3	1	2	2	2	1	1	1	1	11	2	4	28
E	1	0	1	1	3	1	2	2	2	0	1	1	1	10	2	5	32
F	1	1	1	1	4	1	2	2	1	1	1	0	0	8	1	2	20
G	1	0	1	0	2	2	1	2	3	0	1	0	1	10	2	4	27
H	1	1	0	1	3	1	2	2	2	1	1	1	1	11	3	5	34



Candidates selection

Spectrum: as an example

Product assessment

Qualitative evaluation: Descriptor



Quantitative evaluation: Intensity scaling



5. GENERATION OF LATHER

How much time did it take to LATHER? (# of up and down "passes" on your arm / # of squeezes on your arm / # of washes needed to LATHER up)

1 - Immediate

2

3

4

5

6

7 - Took Time

Definitions of Attributes for Green Tea Evaluation		
Attributes	Definition	Reference
Green	Sharp, slightly pungent aromatics associated with green plant/vegetable matter, such as asparagus, Brussels sprouts, celery, green beans, parsley, spinach, etc.	Fresh parsley water = 9.0 (flavour) 25 g of fresh parsley, rinse, chop, and add 300 mL of water. Let it sit for 15 min. Filter and serve liquid part
Asparagus	The slightly brown, slightly earthy aromatics associated with cooked green asparagus	Asparagus water = 6.5 (flavour) Weigh 40 g of fresh asparagus, wash, dice, add 300 mL of water, cover, microwave for 3 min on high. Serve liquid part
Beany	The brown, somewhat musty earthy aromatics associated with cooked legumes, such as garbanzo beans and lima beans	Kroger Small Green Lima Beans (Kroger Co., Cincinnati, OH) = 5.0 (flavour) Measure juice out of can. Dilute: take 1 part of lima beans juice, and mix with 4 part of water
Brussels sprouts	The somewhat sharp, slightly sour, pungent aromatics associated with cooked cabbage, Brussels sprouts and cauliflower	Brussels sprout water = 6.5 (flavour) Weigh 20 g, wash, dice, add 300 mL of water, cover, microwave for 3 min. Filter and serve liquid part
Celery	The slightly sweet, green, brown, slightly bitter aromatics associated with cooked dried celery leaves	McCormick Celery Flakes (McCormick & Co, Inc., Hunt Valley, MD) water = 6.5 (flavour) Weigh 1.5 g, add 300 mL of water, cover, microwave for 3 min on high. Filter and serve liquid part
Green beans	A viney, green, slightly brown, woody aromatics associated with processed green beans	Del Monte Cut Green Beans (Del Monte Foods, San Francisco, CA) (No Sodium) = 5.5 (flavour) Measure juice out of can. Dilute: take 1 part of green beans juice, mix with 4 part of water
Green herb-like	The aromatics associated with dry green herbs such as bay leaves, thyme, basil	Mixture of McCormick bay leaves, McCormick ground thyme, and McCormick basil = 6.0 (aroma) Mix 0.5 g of each herb. Grind using mortar and pestle. Add 100 mL of water. Mix well. Put 5 mL of herb water in a medium-size sniffer. Add 200 mL of water. Cover



Green tea lexicon.
Source: Lee & Chambers (2007).

How to validate panel performance?

Overall process of panel performance measurement



Evaluate general data quality
(Relevance of attributes, non-use of attributes, attribute distributions, panellist scale usage, missing data, sampling issues, etc.)

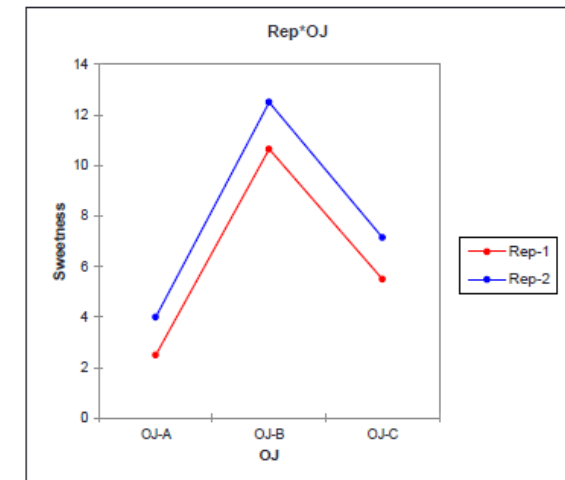
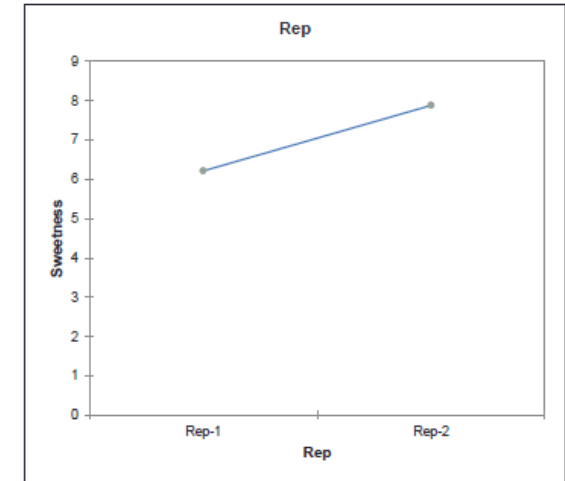
Evaluate repeatability (RMSE values, panellist ranges for product **X** attribute pairs, etc.)

Evaluate discrimination
(Significant product effect for key/expected attributes, overall panel vs. individual discrimination, etc.)

Evaluate consistency
(Number of significant interactions, individuals causing issues by inspection of panellist by product graphs, etc.)

Evaluate overall performance and validity
(Summary tabular/graphical measures of overall panel performance, multivariate analysis, ability of profile outputs to tie in with action standards, etc.)

- Replications F-ratio in ANOVA
- Judge by replication interaction F-ratio in ANOVA



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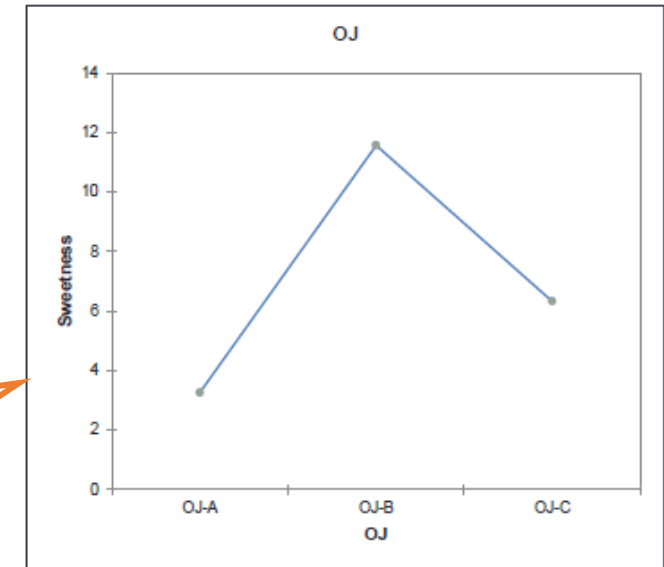
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- Samples F-ratio in ANOVA



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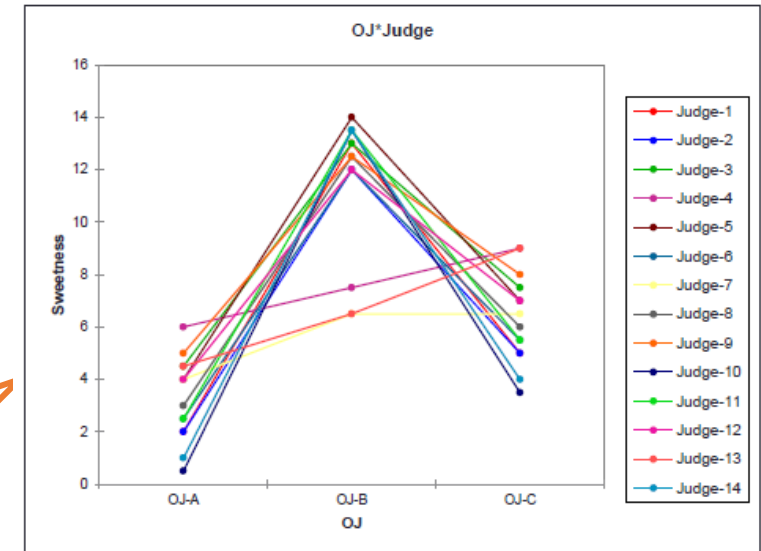
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- Judge by Sample interaction
F- ratio in ANOVA



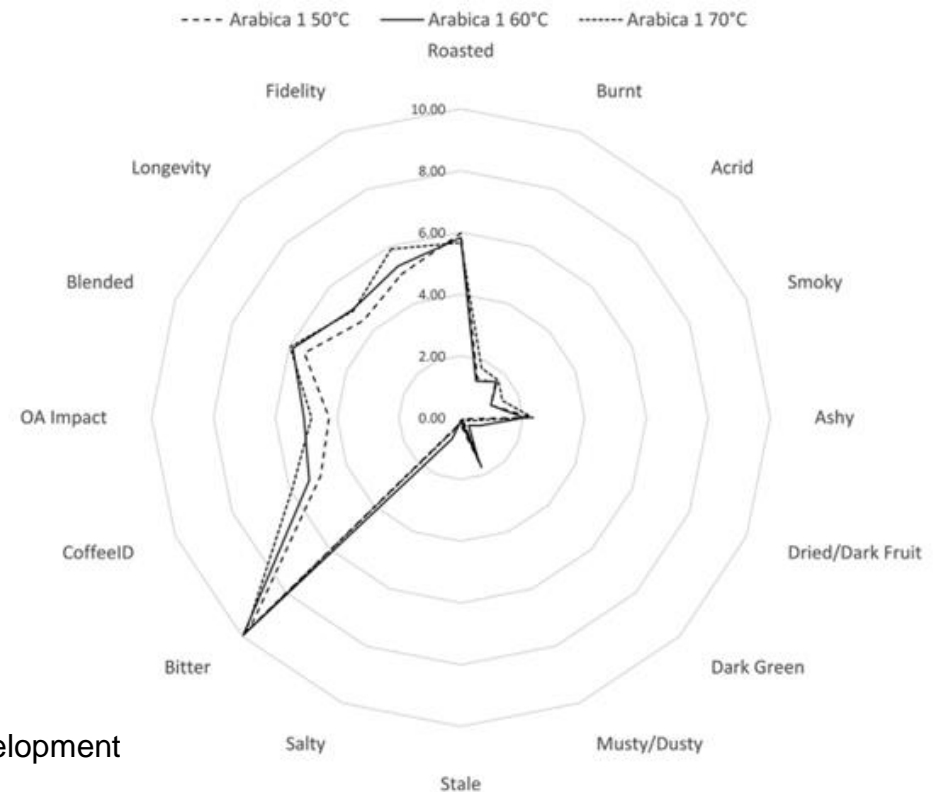


Other simplified Descriptive Analysis

Quantitative Descriptive Analysis (QDA) as an Example

QDA is a consumer based method, not technical or expert based like profile methods, and it provides quantitation data about consumer noticeable product similarities and differences.

QDA was first introduced in 1974 by Herbert Stone, Ph.D., and Joel L. Sidel after its development at the Stanford Research Institute in Palo Alto, CA.



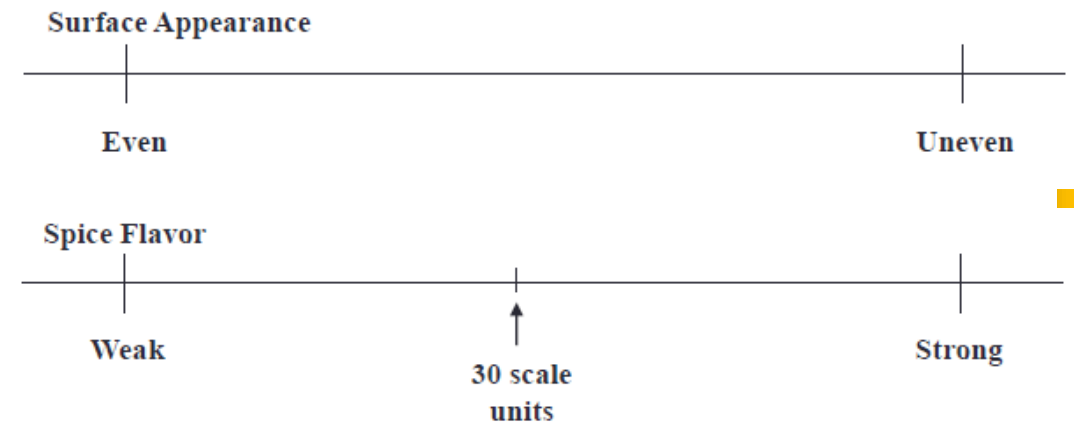
QDA VS. SPECTRUM

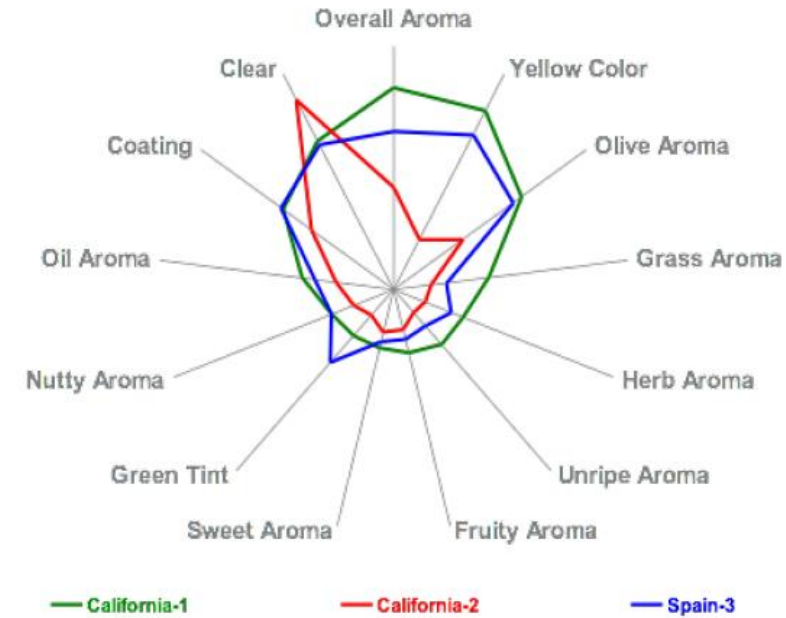
Who are the participators?

- General population, likers and users of product category; Either employee or non-employee; Non-technical;
- Product(s) specific discrimination trials, no stereotypical screening procedures

What is the test protocol?

- Test products used in the language development sessions; Language and definitions in an everyday conversation language;
- The key is to ensure that the subjects are “familiar” with the products. No surprises in the booth!
- Simplified scale with no reference before language development





Benefits of QDA:
LESS EFFORTS,
SHORTER TIME

- A QDA test is a complete “picture” of an array of products.
- When combined with attitudinal and imagery measures it has important business implications.
- A descriptive panel records what is perceived, it cannot provide an unbiased preference judgment.
- A descriptive panel measures what is perceived using all attributes, but all attributes are not equally important.