FLAVOR COMPLEXITY…

Can Descriptive Panels Analyze This Consumer-Relevant Concept?

Suzanne Pecore, Susan Hooge and Carol Uy

Product Guidance & Insights

September, 2014

GENERAL MILLS

THE INTEREST IN "COMPLEXITY"

- Current analytical sensory measures do not capture the complexity of the eating experience.
- Traditional methods work to deconstruct this experience into measurable, singular aspects.
- As a result, we are sometimes unable to evaluate for consumer-relevant differences based on their holistic experience.

DESCRIPTIVE ANALYSIS IS LIMITED

- Current definitions limit Descriptive Analysis to the detection, description and quantification of singular attributes of products under very controlled protocols.

  "Any method to describe and quantify the sensory characteristics of stimuli by a panel of trained assessors." (1)

- The first descriptive method, The Flavor Profile, was more holistic in its approach, attempting to capture more using Amplitude.

  "Flavor consists of perceptible factors in taste, odor and feeling plus underlying complex of factors not separately identifiable."

  "*In the formative stages of the profile method we found it inadequate to express flavor only in terms of its analyzable components."* (2)

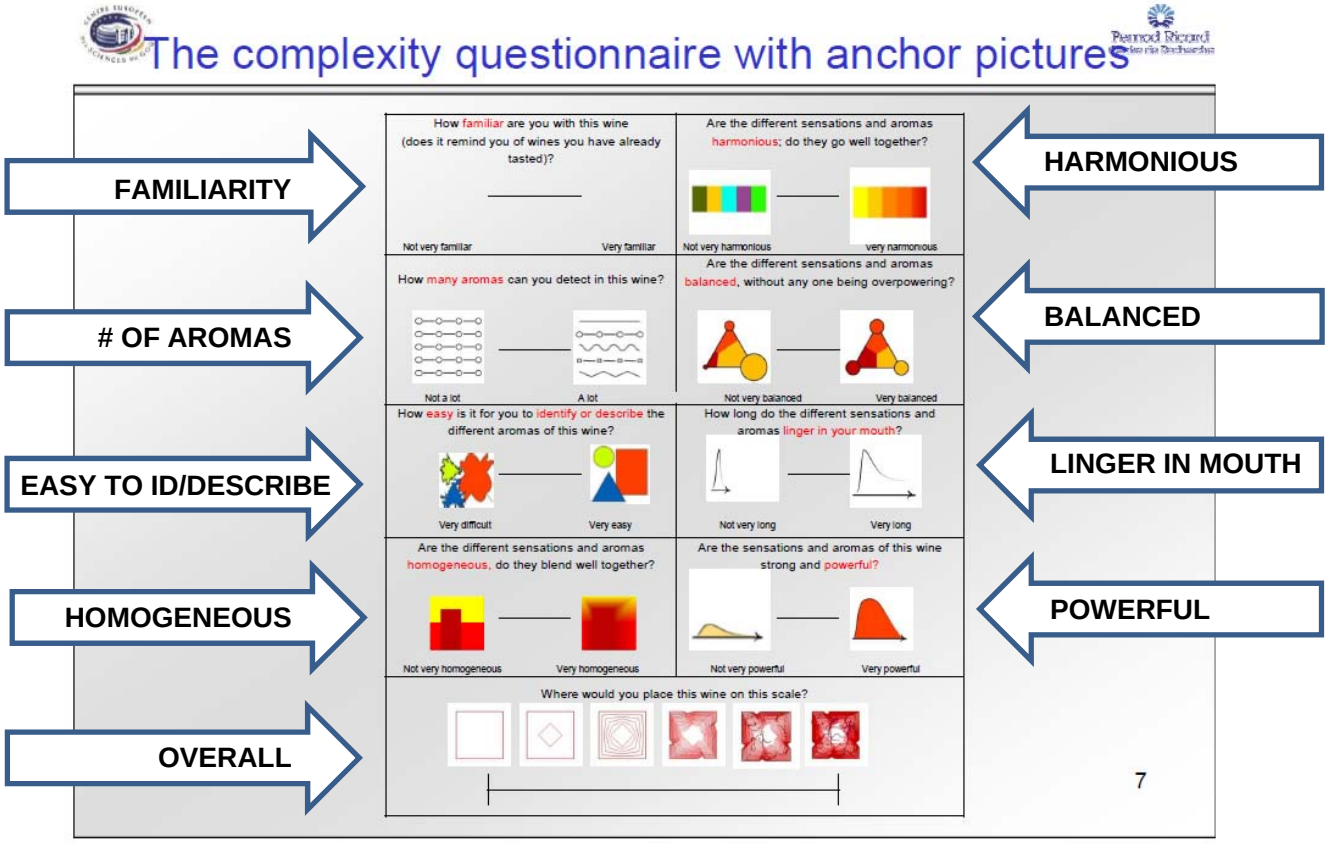
Is there a way to expand our analytical sensory methods to encompass this complexity?

(1) ASTM E253-13, "Standard Terminology Relating to Sensory Evaluation of Materials and Products"

(2) Caul, J.F. Vol 7, "The Profile Method of Flavor Analysis," *Advances in Food Research,* E.M. Mrak and G.F. Stewart, Eds., Academic Press, New York, 1957, pp 1-40.

COMPLEXITY DEFINED

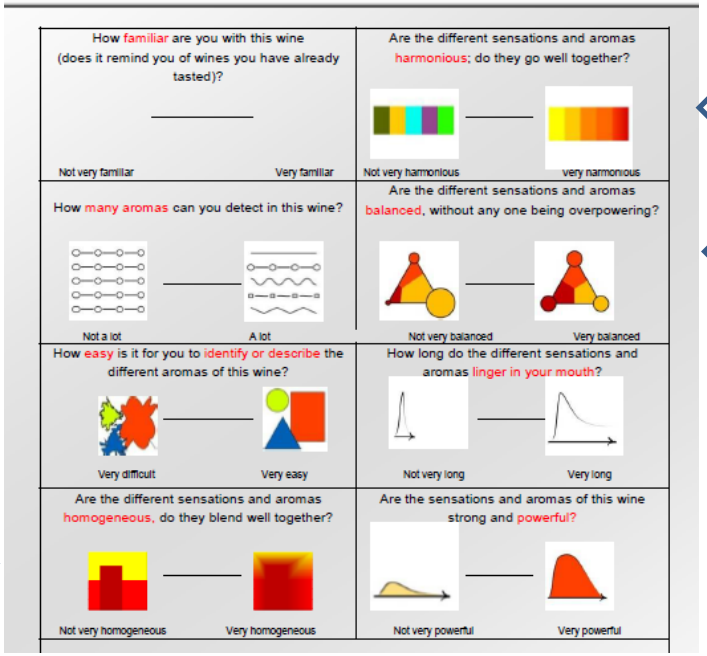
- Visual aids used to train naïve consumers in evaluation of wine complexity. (1)



(1) M. Medel, et al., "Assessing the perceived complexity of wine", Pangborn Symposium, Florence, 2009

THE COMPLEXITY "METHOD"

- Worked with existing panelists trained in Sensory Spectrum™ Method; discussed Medel's terms using same visual aids and varying product examples
- Focused on three terms (English versions) not covered in current descriptive evaluations



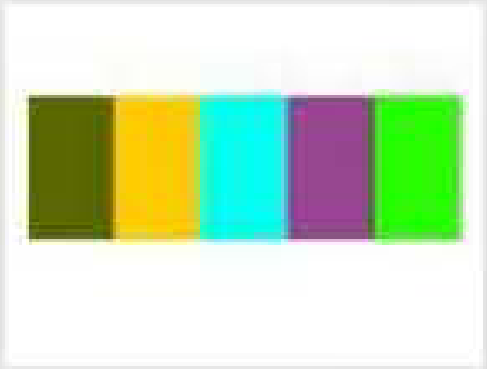
HARMONIOUS

BALANCED

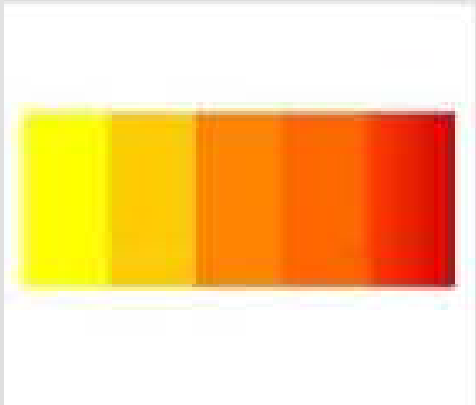
BLENDED

ADAPTED FOR TRAINED PANEL USE - HARMONIOUS

Are the different sensations and aromatics harmonious; do they go well together?



Not Very Harmonious

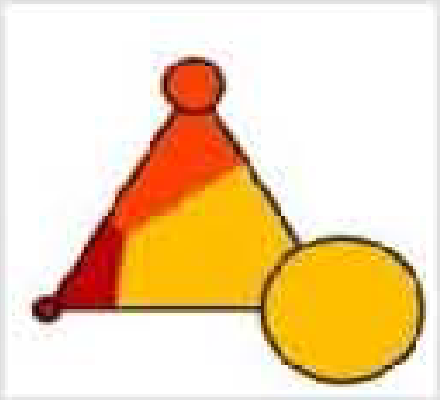


Very Harmonious

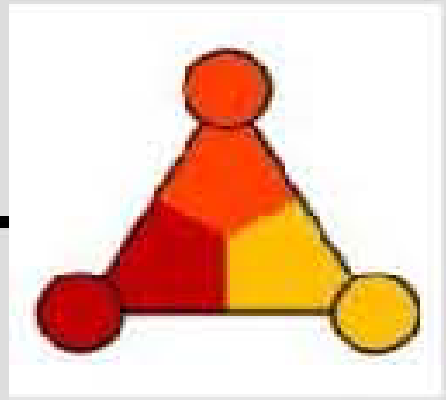
Harmonious: The degree to which the aromatics that are detected make sense together and complement one another. (Ex: Mushrooms & Beef; Caramel & Apple, etc.)

ADAPTED FOR TRAINED PANEL USE - BALANCE

Are the different sensations and aromatics balanced, without any one being overpowering?



Not Very Balanced



Very Balanced

Balance: The degree to which aromatics detected in the sample are equally perceived.

ADAPTED FOR TRAINED PANEL USE - BLENDED

Are the different sensations and aromatics blended?



Not Very Blended

Very Blended

Blended: The degree to which the aromatics in the sample blend together; a measure of the overall blendedness of the product. If high in blended it is difficult to tell where one flavor starts and another flavor ends.

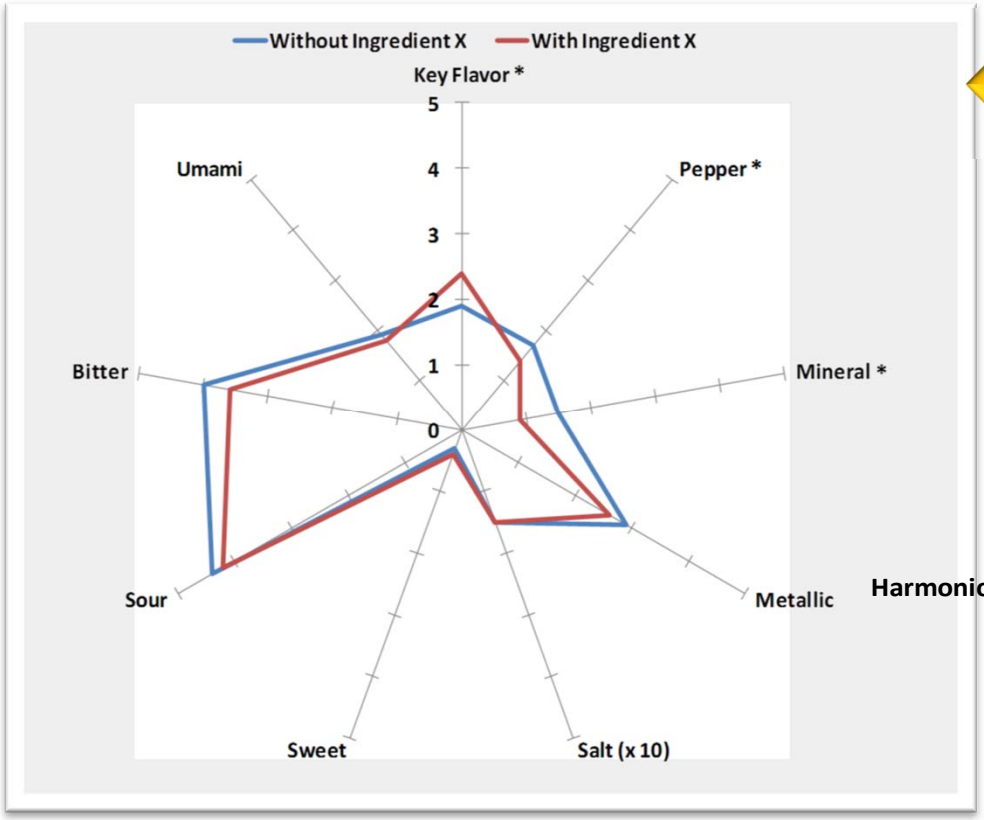
DEVELOPMENT OF PANEL, CONTINUED

- **Established a qualitative scale to represent differences**

VL	Very Low
L	Low
LM	Low - Medium
M	Medium
MH	Medium - High
H	High

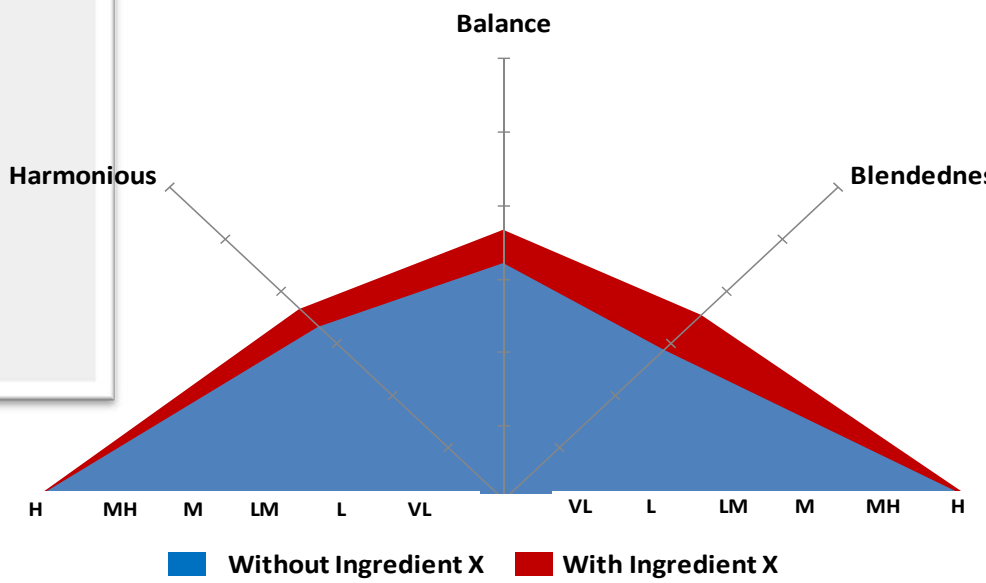
COMPLEXITY MEASURES IN USE

- Appeared useful with savory products



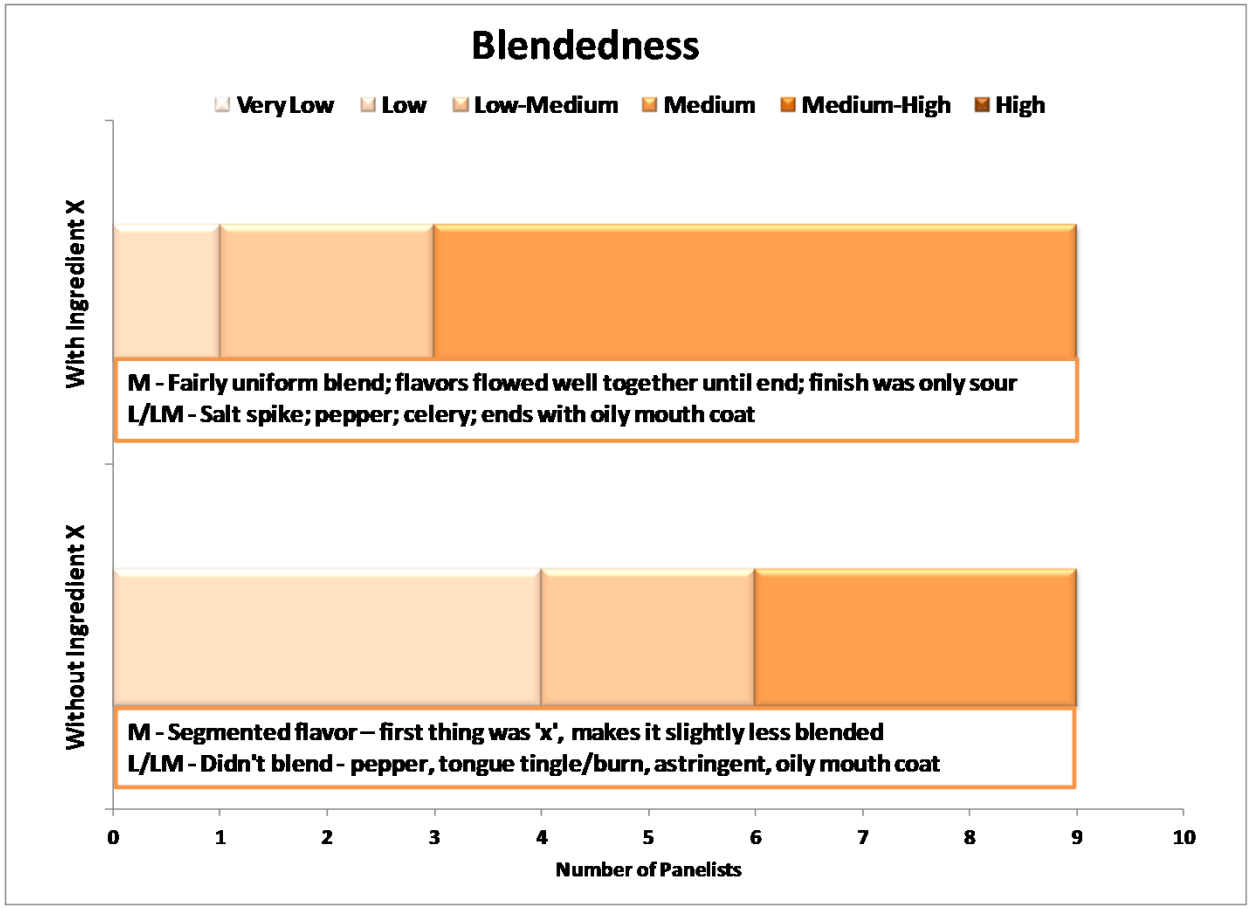
Flavor differences subtle; no differences in umami

Complexity shows differences



COMPLEXITY MEASURES IN USE

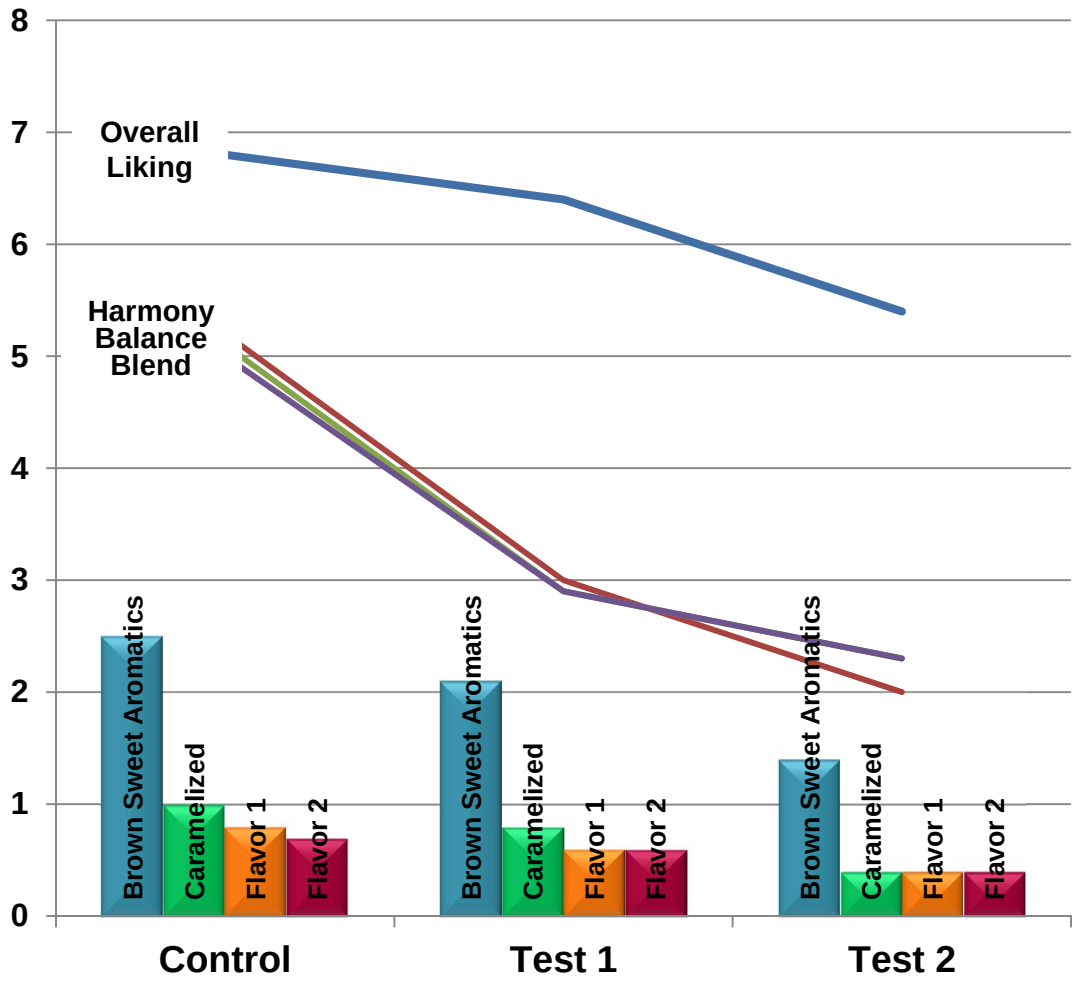
- Qualitative discussion often more important



IS THERE AN "OPTIMAL" COMPLEXITY?

- Are higher values better?
- Are some aspects more critical to acceptability?
- Does it vary by product category?

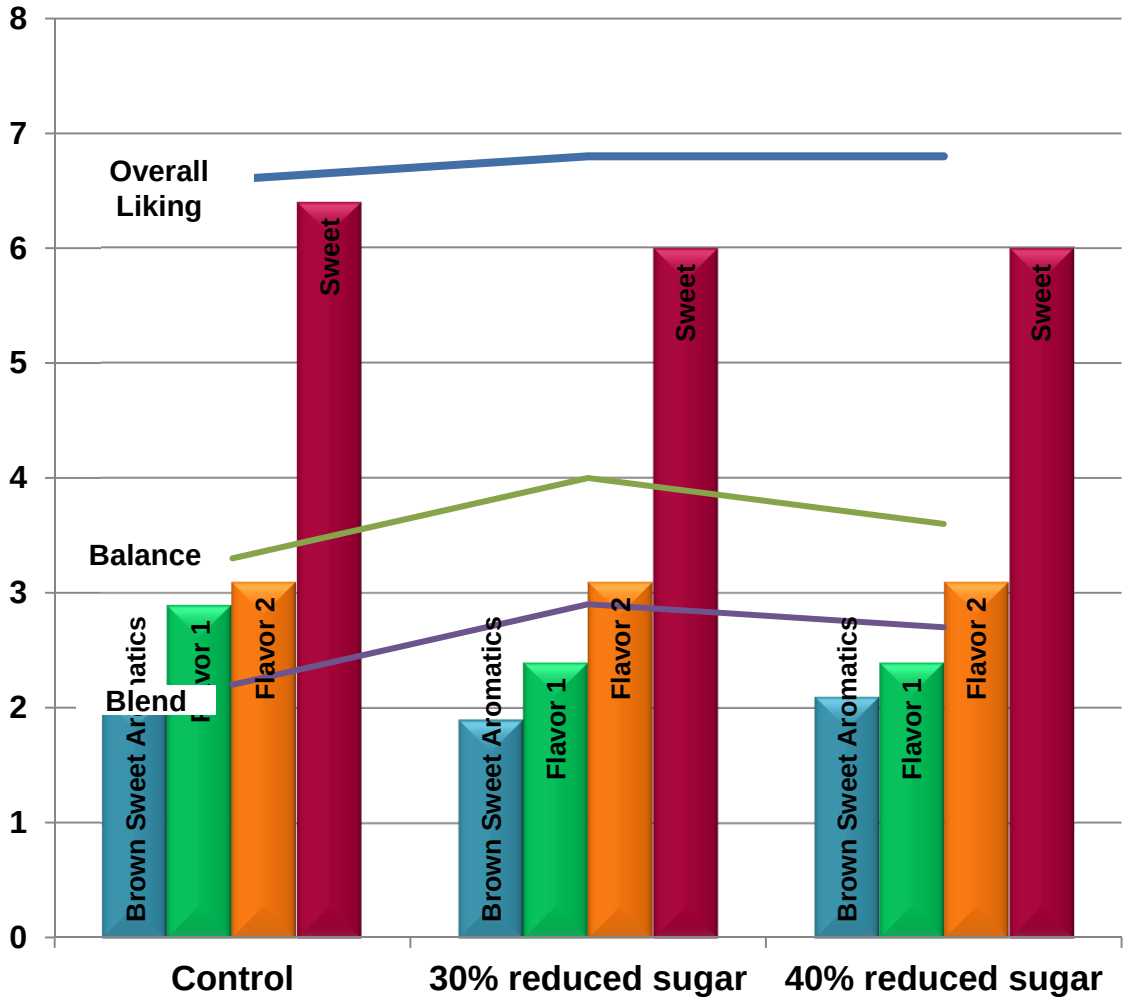
COMPLEXITY IMPACTS LIKING



Complexity decline in Test 1 contributed to slight loss in liking, despite similar flavor profile.

Complexity decline in combination with loss of flavor = significant loss in liking.

CONSUMERS RESPOND POSITIVELY TO "MORE" COMPLEXITY DESPITE LOSS OF INTENSITY

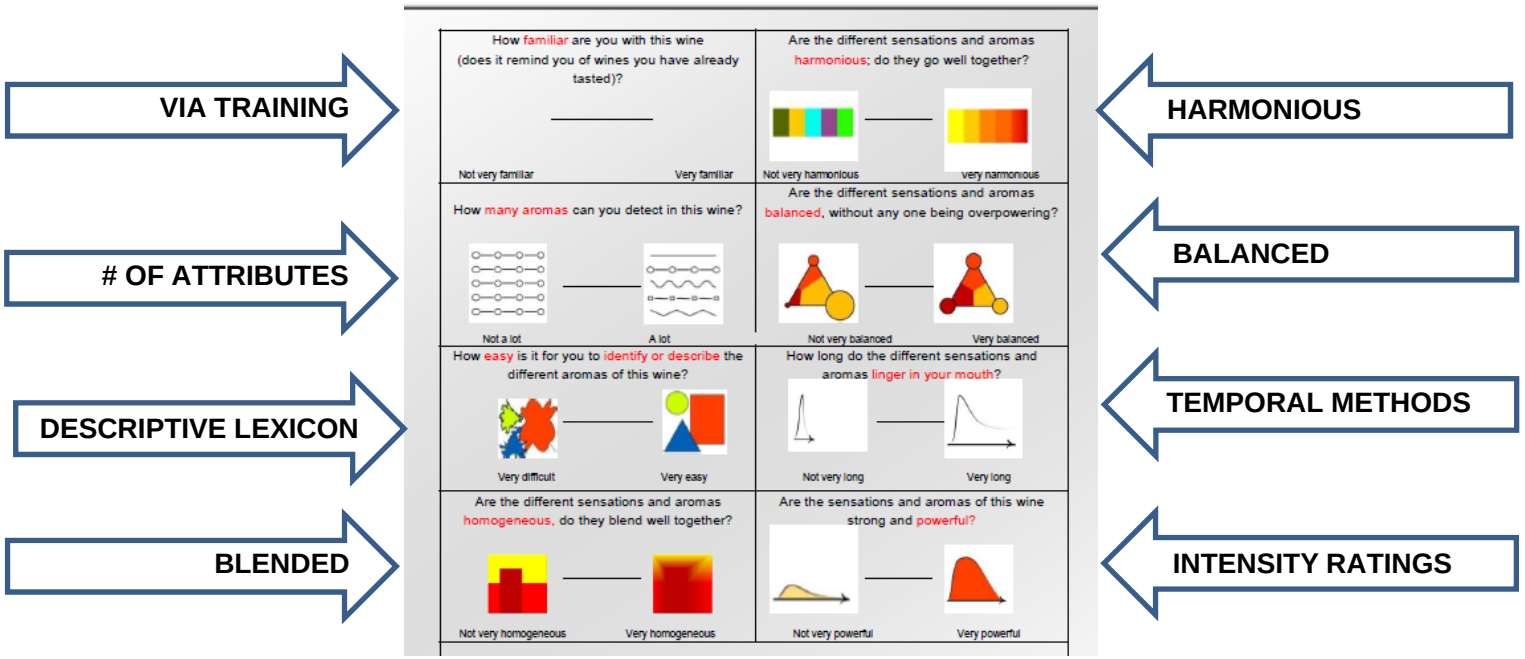


Liking retained despite loss in key flavor & sweet taste.

Due to increase in Balance and Blend?

RETHINKING COMPLEXITY

- Medel's Model seems complete
- And we have descriptive panel tools to measure all aspects:



SENSORY BEST PRACTICES ENSURE SUCCESSFUL COMPLEXITY EVALUATION

- Complexity measures are essentially qualitative, NOT quantitative
- Panel leader needs to keep panelists focused on complexity language/definitions; visual aids helpful
- Complexity sessions held separately from descriptive evaluation sessions
- Value is in the discussion – team members should be in attendance

Descriptive Panels can help you uncover that "underlying complex" noted by Jean Caul

Summary

SOCIETY OF SENSORY PROFESSIONALS

Strengths	Weaknesses
• Measures aspects of eating experience not covered with typical descriptive analysis • Shows relevance to consumer responses	• Harmony can be driven by *familiarity* with flavors • Does not capture the complexity within a meal context
Opportunities	**Threats**
• Further understanding importance of differing aspects of complexity • Further understanding how complexity varies by product category • Explore this method using consumer respondents	• May focus on aspects with low impact on purchasing behavior • Differences may not translate across borders or cultures

ACKNOWLEDGEMENTS

- My co-authors, Susan Hooge and Carol Uy
- GMI Colleagues that championed this method, Candi Rathjen-Nowak and Terese Tamminen
- Dr. Medel for permitting use of her visual aids
- All of our Descriptive Panelists involved in this

