

Understanding Flavor Complexity: What Individual Attributes Can't Tell

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Skillful Science. Savvy Solutions.



A classic Product Description

- ◆ Wheat
- ◆ Yeasty
- ◆ Sour Aromatics
- ◆ Bitter
- ◆ Salty
- ◆ Sour
- ◆ Doughy
- ◆ Musty (damp, earthy)
- ◆ Musty (dusty, old leather)
- ◆ Oily
- ◆ Dairy Sour
- ◆ Lemon
- ◆ Malic Acid
- ◆ Vinegar
- ◆ Astringency
- ◆ Tongue Numbing
- ◆ Sweet





Sensory Description

- In the 1940' and 50's the Flavor Profile was developed by Arthur D. Little, Inc.
- Researchers recognized that part of the sensory description was unable to be described as a specific attribute
 - Called it amplitude
 - The balanced, blended, fullness of the flavor in the mouth.
 - Measured as low, moderate, or high

Criticism of “Amplitude”

- Not an attribute
- Not really measureable
- Too dependent on panel
- Really just a measure of liking
- Amplitude fell out of favor
 - Different term “overall impact” became more common
 - Even that is not in common use

Describe “same” but “different”

- Complexity
- Interaction is key, but we lose that in describing individual attributes
- Not about the combination of “notes” into a different characteristic
- Is about the combination of “notes” into a different “experience”

Same, but Different - Describe



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Research Project - People

- Kansas State University
- Sensory Spectrum
- Wolf Sensory
- Frito Lay
- Tallinn Technological University
- Kasetsart University
- Assumption University
- King Mongkut University



Research Project - Products

- 20 samples of Gelato
- Intentionally chose various flavors that would be difficult to describe on the same lexicon
- Varied in manufacturer
- Florence, Italy



Research Project – What we did

- Discussed “Complexity” prior to trip, by e-mail and telephone.
- Met and tasted products
- Discussed more: everyone on the same page – multifaceted
- Discussed terms and definitions
- Tasted products refined terms and definitions
- Tasted products, came to consensus on scores.

Impact

- The maximum overall sensory impression during early mastication.
 - Scored either at initial consumption or the first few seconds in order to provide time for the sensory properties to bloom.
- Note:
 - Provides the most information if scored relative to the product category.

Blended

- The melding of individual sensory notes such that the products present a unified overall sensory experience as opposed to spikes or individual notes

Balance

- The extent to which the sensory notes are in proportion and complementary to each other.

Complexity

- The existence of multiple sensory attributes or sensory layers that make up a singular sensory experience.

Longevity

- The time that the full integrated sensory experience sustains itself in the month and after swallowing

Fidelity

- The total sensory experience of the trueness of the product in the stated context; its believability.
- Note:
 - Fidelity cannot be scored if testing is blind.
 - Fidelity may not be appropriate for innovative prototypes.
 - The same product could have varying fidelity depending on regional or cultural perspectives.

Amplitude

- The integration of impact, balance, blended, complexity, and longevity that presents a unified, full sensory experience.

Integrity

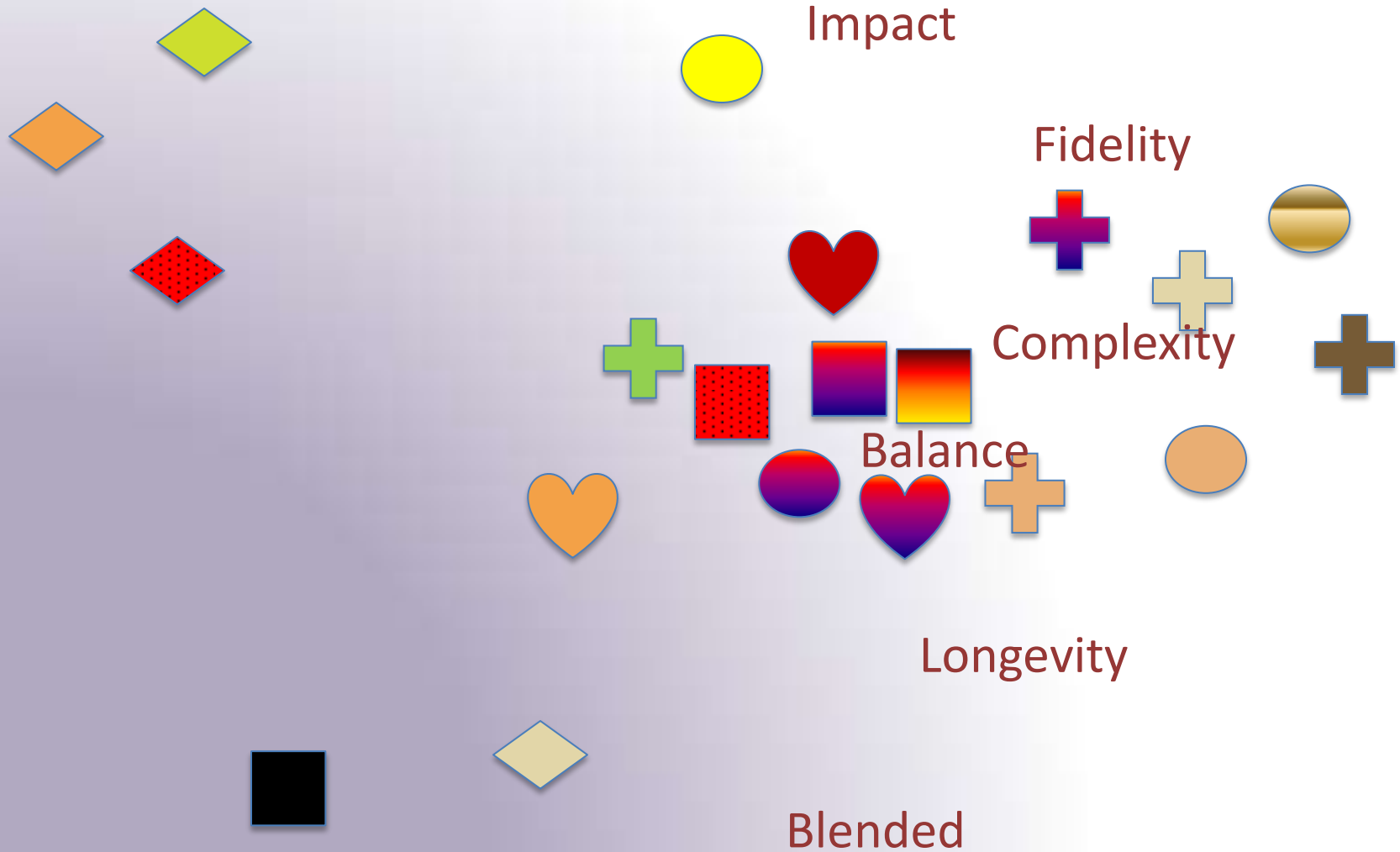
- The integration of Impact, Balance, Blended, Complexity, Longevity, and amplitude with Fidelity that presents a unified, full sensory experience that compliments the stated expectation.

Not measureable unless Fidelity is measured.

Amplitude and Integrity

- These terms represents the “Personality” of the product. A product with a complete “personality” that is full, “blooms”, and sustains itself will be high in amplitude/integrity
- When all aspects are high the overall amplitude/integrity will be high. When one or more of the aspects are reduced the Amplitude may be reduced, but not necessarily.
- These aspects may vary in their influence. For example, if Fidelity is known and is low, the Integrity is dramatically reduced.

Products and Attributes



Conclusions

- Good agreement on terminology
- Good Agreement on the application of the terminology
- Terminology differentiates products – particularly manufacturers of gelato samples
- Differentiates in a way that traditional flavor attributes cannot.