FDE443 SENSORY ANALYSIS

Lesson-8

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Factors Influencing Sensory Verdicts

Psychological Factors

Factors Influencing Sensory Verdicts

- ✓*The panelists as measuring instruments:* variable over time and among themselves, and very prone to bias.

- ✓In order to minimize variability and bias, the panel leader needs to take into account factors which might influence sensory perception;

  - ✓The physiological factors
  - ✓The psychological factors

Physiological Factors

Adaptation

- ***Definition:*** a decrease in or change in sensitivity to a given stimulus as a result of continued exposure to that stimulus or a similar one.

- In sensory testing this effect is an important unwanted source of variability of thresholds and intensity ratings.

- Types:
  - Cross-adaptation
  - Cross-potentiation or facilitation

Physiological Factors

Adaptation

➢ *"Cross-adaptation"*

	Adapting stimulus	Test stimulus
Condition A	H_2O	Aspartame
Condition B	Sucrose	Aspartame

❖ The person in condition B is likely to perceive less sweetness in the test sample because the tasting of sucrose reduces his sensitivity to sweetness. The water used in condition A contains no sweetness and does not fatigue (or cause adaptation in the perception of sweet taste).

Physiological Factors

Adaptation:

✓ "cross-potentiation" or facilitation:

Condition A	**H_2O**	**Quinine**
Condition B	**Sucrose**	**Quinine**

❖ In condition B, the observer perceives more bitterness in the test sample because the tasting of sucrose has heightened his sensitivity to quinine.

Enhancement or Suppression

- The interaction of stimuli presented simultaneously as mixtures.
  - **Enhancement**—The effect of the presence of one substance increasing the perceived intensity of a second substance.
  - **Synergy**— The effect of the presence of one substance increasing the perceived combined intensity of two substances
    - the perceived intensity of the mixture is greater than the sum of the intensities of the components.
  - **Suppression**— The effect of the presence of one substance decreasing the perceived intensity of a mixture of two or more substances.

Enhancement or Suppression

✓Total perceived intensity of mixture

Situation	Name of effect
MIX < A + B (each alone)	Mixture suppression
MIX > A + B (each alone)	Synergy

✓Components of analyzable mixture:

Situation	Name of effect
A′ < A	Mixture suppression
A′ > A	Enhancement

Key:

- MIX = perceived intensity of mixture
- A = perceived intensity of unmixed component A
- A´ = perceived intensity of component A in mixture

Psychological Factors

- ✓Expectation Error
- ✓Error of Habituation
- ✓Stimulus Error
- ✓Logical Error
- ✓Halo Effect
- ✓Order of Presentation of Samples

Psychological Factors

Expectation Error

- ✓Information given with the sample may trigger preconceived ideas.
- ✓Panelists usually find what you expect to find.
- ✓A series of ascending concentrations: the panelist anticipates the sensation and reports the response before it is applicable.
- ✓A panelist who learns that a product recall (stale product), there will be a tendency to detect aged flavors in the samples.
- ✓A beer taster's response to bitterness might be biased if s/he knows the hop rate employed.

Psychological Factors

Expectation Error

✓Important for the validity of a test

✓Avoid expectation error: keep the source of samples a secret and donot give panelists any detailed information before the test.

✓ Random coding and order of presentation

Psychological Factors

Error of Habituation

- ✓A tendency to continue to give the same response when a series of slowly increasing or decreasing stimuli are presented, for example, in quality control from day to day.
- ✓The panelist tends to repeat the same scores and thus to miss any developing trend or even accept an occasional defective sample.
- ✓Solution: varying the types of product or presenting doctored samples

Psychological Factors

Stimulus Error

- ✓When irrelevant criteria, such as the style or color of the container, influence the observer.
- ✓If the criteria suggest differences, the panelist will find them even when they do not exist.

Examples:

- ✓wines in screw-capped bottles may receive lower ratings than those served in cork-closure bottles.
- ✓Urgently called panel sessions might trigger reports of known production defects.
- ✓Samples served late in a test may be rated more flavorful because panelists think that the panel leader will present light-flavored samples first to minimize fatigue.

Psychological Factors

Logical Error

- ✓When two or more characteristics of the samples are associated in the minds of the assessors.
  - ➢Knowledge that a darker beer tends to be more flavorful, or that darker mayonnaise tends to be stale, causes the observer to modify the response.
- ✓Solution: keep the samples uniform and mask differences with colored glasses, colored lights, etc.

Psychological Factors

Logical Error

- ✓ Sometimes they cannot be masked but may be avoided.
  - ✓ For example, a more bitter beer will always tend to receive a higher score for hop aroma.
  - ✓ With trained panelists: doctoring a sample with quinine in order to produce high bitterness combined with low hop aroma

Psychological Factors

Halo Effect

- ✓When more than one attribute of a sample is evaluated, the ratings will tend to influence each other.
- ✓Simultaneous scoring of various flavor aspects along with overall acceptability can produce different results rather than if each characteristic is evaluated separately.
- ✓Solution: present separate sets of samples for evaluation of that characteristic

Psychological Factors

Order of Presentation of Samples

✓Types of bias caused by the order of presentation:

1. Contrast effect
2. Group effect
3. Error of central tendency
4. Pattern effect
5. Time error/positional bias

Psychological Factors

Order of Presentation of Samples

- ✓ Contrast effect — Presentation of a sample of good quality just before one of poor quality may cause the second sample to receive a lower rating than if it had been rated monadically (i.e., as a single sample).

- ✓ The converse: a sample that follows a particularly poor one will tend to be rated higher.

- ✓ Group effect— One good sample presented in a group of poor samples will tend to be rated lower than if presented alone.

  - ➢ the opposite of the contrast effect.

Psychological Factors

Order of Presentation of Samples

- ✓ Error of central tendency— Samples placed near the center of a set tend to be preferred over those placed at the ends.
  - ✓ In triangle tests, the odd sample is detected more often if it is in the middle position.
  - ✓ An error of central tendency is also found with scales and categories
- ✓ Pattern effect— Panelists are quick to detect any pattern in the order of presentation.

Psychological Factors

Order of Presentation of Samples

- ✓Time error/positional bias—anticipation or even hunger for the first sample, to fatigue or indifference with the last.
- ✓Often, the first sample is abnormally preferred (or rejected).
- ✓A short-term test (sip and evaluate) will yield a bias for the sample presented first.
- ✓A long-term test (one-week home placement) will produce a bias for the sample presented last.
- ✓Discrimination is greater with the first pair in a set than with subsequent pairs.

Psychological Factors

- These phsychological effects have to be minimized by;

✓ ***"Balanced presentation" :*** each of the possible combinations is presented an equal number of times.

  ✓ Each sample in a panel session should appear an equal number of times in 1st, 2nd… and nth position.

✓ ***"Randomized order of presentation":*** the order of combinations has to appear according to the laws of chance.