TETRAD: THE UP AND COMING DISCRIMINATION TESTING METHOD

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Do you need to change ingredients due to cost constraints, change process due to manufacturing efficiencies or change packaging due to new materials — all while not compromising consumer acceptance of your products? When changes like this are made, proper sensory testing is needed to ensure a seamless transition in the marketplace.
Discrimination Testing Helps You Hit the Mark

Discrimination tests are useful analytical tools utilized by sensory professionals to help product developers achieve consumer acceptance of product changes.

There are many different methods of discrimination testing, such as duo-trio, triangle, paired comparison and the new kid on the block — tetrad. All methods, however, are intended to answer a seemingly simple question, “Are these products perceived as different or are they similar enough to be used interchangeably?”

Tetrad a Solid Alternative to Triangle Test

The triangle test is one of the most popular discrimination methodologies used in consumer product companies. Joseph E. Seagram and Sons were the first to use this method in 1941 for product quality. Since then, it has been used in a variety of applications including product discrimination testing and panelists’ selection.

An advantage of the triangle test is that it does not require specification of the nature of the difference, i.e., sweeter, more chocolate flavor, etc. But the triangle test does require large sample sizes (amount of participants) to be effective.

Recently, the tetrad test has received interest because it can be a powerful tool that delivers results equal to the triangle test, but with smaller sample sizes. The sample sizes required for the tetrad test are theoretically only one third that required by the triangle test. Importantly, like the triangle test, the tetrad test does not require specification of a sensory attribute.
How a Tetrad Test Works
In the tetrad test, four stimuli are presented to respondents. Two stimuli come from one group (A), while the other two come from a different group (B). Respondents are asked to group the samples into two groups of two based on similarity.
Why Being Able to Use Fewer Panelists Matters
The tetrad test requires fewer panelists for the same risk profile as current triangle test. Fewer products are required for testing which makes it easier for R&D to make samples. Fewer respondents are needed which means less testing time and less complexity for the lab, which leads to increased testing capacity.
Managing Risk

Tetrad tests manage risk better than triangle tests when monitoring for type I and type II errors. Type I error (or alpha risk) is the probability of wrongly concluding that a difference exists between the products. Helping to minimize this error can reduce time R&D would spend reformulating for no reason. Type II (or beta risk) is the probability of wrongly concluding that no difference exists between products. Reducing these errors provides R&D with a certainty that the products do taste different and reformulation is necessary.
Conclusion

To stay competitive, businesses must reduce costs while increasing the quality of their decisions. Sensory science can play a central role in the achievement of these seemingly contradictory objectives by providing efficient testing methods that give more reliable information at lower costs.

In particular, the tetrad test holds promise as a viable replacement for the triangle test in situations where the addition of a fourth stimulus does not cause so much additional perceptual noise as to overwhelm the theoretical advantage of tetrad testing. The extent to which the addition of a fourth stimulus causes an increase in perceptual noise and a corresponding decrease in effect size is an experimental question that depends on the product category.

It is strongly recommended that companies have a very thorough understanding of their products and existing discrimination panels before deciding to switch from the triangle method to the tetrad method. Testing their own products with both methods should prove to be beneficial to companies considering making the switch.
References


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