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AN EXPLORATION OF SENSORY PERFORMANCE BENCHMARKING

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Introduction To Benchmarking & The Curion Score™

To gain and maintain market advantages, food product companies follow this typical process: identify an unmet consumer need, develop a product that targets it, conduct product testing to validate the sensory performance, and finally ready the product for sale. At the core of this process are sensory science techniques designed to investigate the uniqueness and sensory performance of products.

Until recently accessing historical results remained difficult due to disparate supplier strategies, data storage methods, and priorities. Research is often presented as "one and done" to meet a specific objective rather than be part of a longitudinal research program. With the advent of digital technology, cloud storage, and better data literacy, the research industry, driven by the large food manufacturers, is moving towards aggregated databases to help expand the context of product testing to include historical reference points.

In this process the most often measure used to assess is Overall Liking (AOL). It has been previously reported that Overall Liking is not suitable for comparing individual results to groups (Lim, 2009, 2011). Despite this limitation, it continues to be used in this manner. The research discussed here leverages Curion's database of many 1,000s of products to assess the feasibility and risks of using OAL for benchmarking. Further we propose an alternative approach, the Curion Score, integrating information from hundreds of products within a category rather than a single product, for benchmarking.

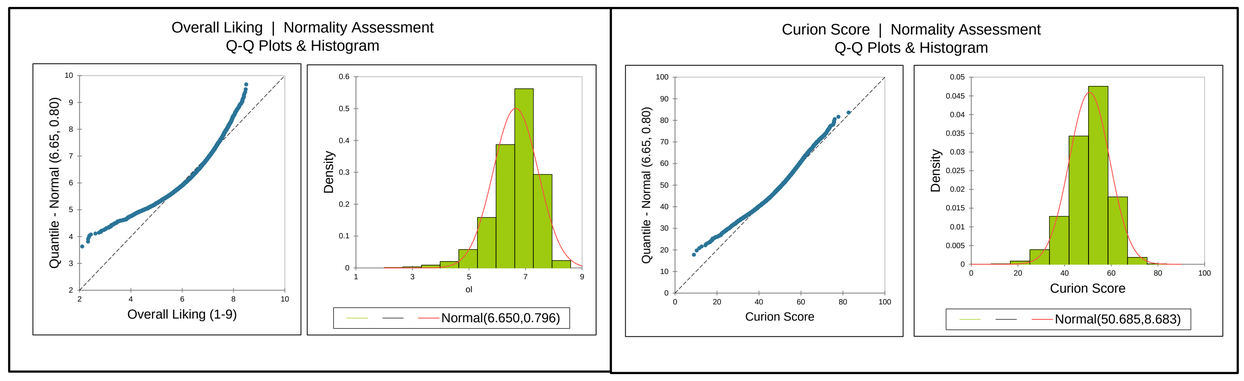
METHOD for Meta Analysis

These descriptive statistics are run on an extract from Curion's product testing database containing 8,491 product ratings across a number of attributes. The product testing database contains data collected from thousands of commercial product tests, with consumers, and allows us to investigate context biases and study effects across a wide variety of study types and designs, at scale. CurionScore™ is a proprietary composite score and algorithm that adapts to individual context effects and applies corrections. Charts were produced in XLStat v2022.1.2.

Meta-Analysis Results

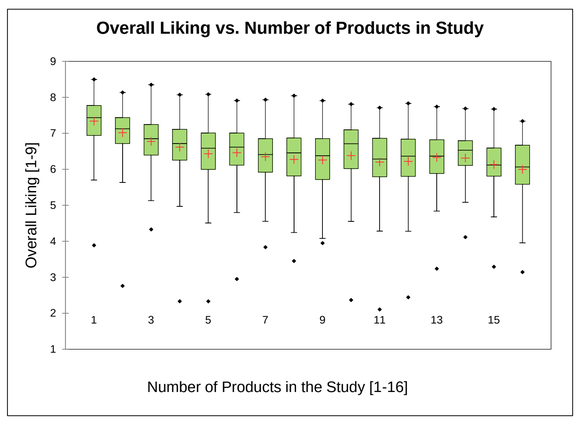
NORMALITY

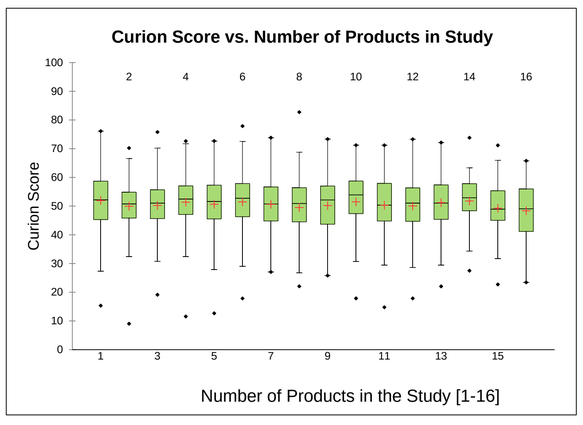
Skewness of OAL limits ability to discriminate at the upper end of the scale (where most product scores fall).



PRODUCT COUNT EFFECTS

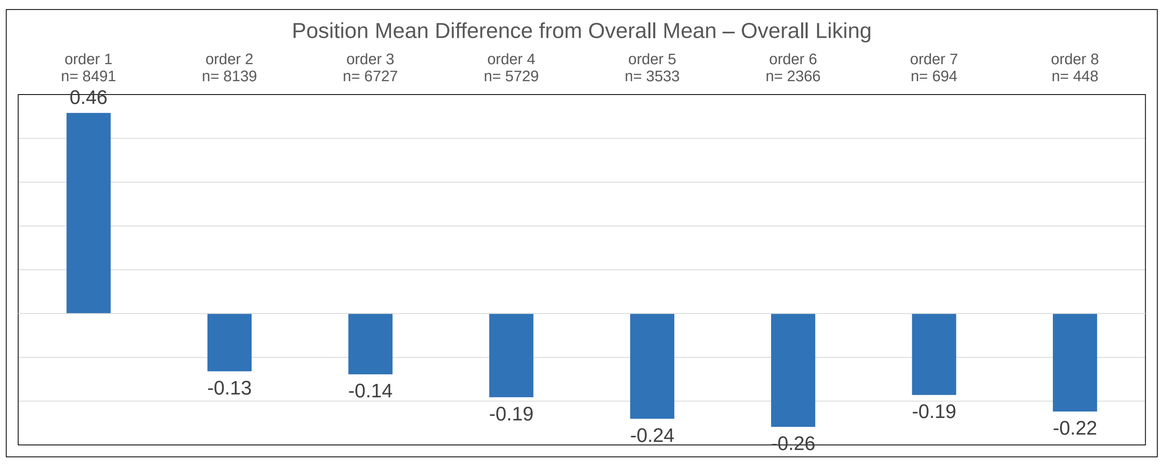
The context effect from the number of products corresponds to position effects. Between 1-5 products the context effect on OAL causes it to drop by 0.9 units, a full 10% of the scale! The Curion Score corrects for this effect, allowing benchmarking to proceed across studies with multiple different designs.





POSITIONAL EFFECTS

This chart shows the well-known first position effect and contextual bias associated with Overall Liking. The majority of the order effects are attributed to the first product in a test. It seems that it takes two evaluations to fully set the context for the test, where scores tend to stabilize.



Why Curion Score?

The Curion Score was designed from the ground up as a total product performance measure. It is a composite score calculated holistically on the results of a product test rather than relying on a single data point. It includes measures related to hedonics and direction for optimization and excludes measures related to branding, pricing, and other non-product context effects. Its use in studies allows clients compare the results from their studies to our aggregated historical database, organized by product category.

Discussion & Conclusion

Our research shows the impact of context effects on OAL at scale across thousands of studies. These context effects, including study design effects and scaling effects, must be overcome to create reliable benchmarks. Curion's approach to category benchmarking, the Curion Score, overcomes these context effects to provide a more holistic and reliable approach to benchmarking.

Curion is interested in talking to researchers wishing to investigate study effects across our database. Please reach out to Michael if you would like chat.