Comparative Study On Practicability Of 9-Point Hedonic Scale And 5-Point Hedonic Scale For Beverages

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Abstract

This study was to investigate whether the 9-point and 5-point hedonic scales were interchangeable while comparing the performance, potential limitations, and effects on the other typical consumer testing preference, ranking, attribute diagnostics, etc.) for both scales. Herbalife’s employee consumer panel (N=100) evaluated multiple flavored protein shakes and Cranberry flavored Aloe drink using both 9-point and 5-point hedonic scales, respectively. High correlations (R² = 0.96) were observed between the two scales in all liking attributes, while the 9-point scale demonstrated a higher sensitivity than the 5-point scale in acceptance discrimination. Ranking results may be associated with the hedonic scores, as the 9-point hedonic scale was more discriminate than the 5-point. Meanwhile, no difference was found for the preference, attribute diagnostics, and usage frequency/intent questions in this study.

Introduction

The most common scale for acceptance testing is the 9-point hedonic scale that was developed in the United States (US) about 70 years ago 1,2. A few studies have been conducted to compare 9-point hedonic with 11-point category scale, labeled affective magnitude (LAM), unstructured line scale, best-worst scaling, while the advantages and limitations of 9-point hedonic scale were discussed3,4. However, 5-point or 7-point hedonic scales were rarely studied or discussed which may be used in some contexts, for example, for minors, or adults with limited education level, etc. The food development trends are focusing on less processed, less sugar, less salt, allergen-free in these years5, which may request a more discriminating consumer acceptance method such as 9-point hedonic scale because of the nature of subtle changes. When comparing these 2 hedonic scales, an important criterion is whether one scale is better at finding differences among products6,7. Although the 9-point hedonic scale is believed to be more sensitive than the 5-point hedonic scale in discrimination, it is beneficial to know whether there is any interactions between the hedonic scales and the other consumer testing questions. The objectives of this research were to compare the 9-point and 5-point hedonic scales in beverage acceptance testing and how the panelists respond to the typical consumer questions following the hedonic tests.

Materials and Methods

Central Location Test

Beverage samples were prescreened and selected to cover the full range of hedonic ratings.

Sample: A total of 9 samples were tested, including 2 Chocolate colored whey protein based shake samples, 2 pairs of Vanilla flavored plant protein based shake samples, and 3 Cranberry flavored Aloe Drink samples with sugar (0g, 2g, and 4g/serve). Contact Dr. Cheng for further details on samples.

Results and Discussion

Hedonic Scale Comparison

The linear regression of all samples across the investigated liking attributes are shown in Figure 2.

A high correlation (Figure 2) is observed between 5-point hedonic scale (“Dislike Very Much” to “Like Very Much”) and 9-point scale (“Dislike Extremely” to “Like Extremely”). Similar linear trends are found across all attributes when the data set is break down by liking attributes (Table 1).

When investigating the data from those who participated in both scale testing, parallel trends are observed (data not shown here). It demonstrates that these panelists were representative for the current subject pool.

Effects on Ranking

Figure 4 shows significant (p<0.05) differences in ranking were observed for all 3 aloe drink samples when testing with the 9-point hedonic scale. However, no significant difference was found between the samples with 2g sugar and 4g sugar with 5-point hedonic scale. The hedonic scales affected the ranking test very highly significantly (p<0.001). As the ranking question was asked after the liking question, it is possible that the liking responses allowed respondents to correctly identify rank the samples. To avoid influence from the acceptance test, the ranking question could be moved to the beginning of the acceptance test questionnaire.

Effects on JAR and Usage Frequency / Intent Questions

No significant (p>0.05) differences were found for the JAR or usage frequency / intent questions when testing with 5-point or the 9-point hedonic scales (data not shown here). This indicates panelists were consistent in responding to these questions regardless of hedonic scale type.

Conclusions

The 9-point and 5-point hedonic scales provide similar data across attributes and products, and can be used interchangeably. However, the 9-point scale is more discriminating than the 5-point, when comparing samples representing small differences. Although the 9-point hedonic scale is more complicated for respondents experienced with the 5-point scale, most were readily able to adopt it without any additional training. The 9-point hedonic scale will be beneficial to timely support the reformulation efforts and meet the consumers’ trends.

References

1. A comparison of the labeled magnitude (LAM) scale, an 11-point category scale and the traditional 9-point hedonic scale; Harry T. Lawless, Richard J. Popper, Beverly J. Kroll, Food Quality and Preference, Volume 21, Issue 1, January 2010, Pages 6-12
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