

# Increasing Sensitivity of Consumer Testing

The impact of presentation design, consumption frequency and cognitive reflection type on test sensitivity

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## Introduction

Hedonic tests are carried out to identify differences in liking between a set of samples. The present study aims at assessing the factors that influence the sensitivity of a Central Location Test. Based on a literature survey, three factors were chosen for evaluation: presentation design, consumption frequency (heavy and light user) and cognitive reflection types. Regarding the presentation design, it was assumed that simultaneous testing favours product discrimination in comparison with serial monadic testing. With regard to consumption frequency, it has been stated that heavy users better distinguish between samples than light users. Moreover, literature suggests that the cognitive reflection type (fast thinking or slow thinking) affects discrimination as well. "High reflection thinkers" (that resist giving spontaneous answers) are said to increase discrimination compared to "low reflection thinkers" (that decide spontaneously) because they are less affected by product range effects.

## Figures

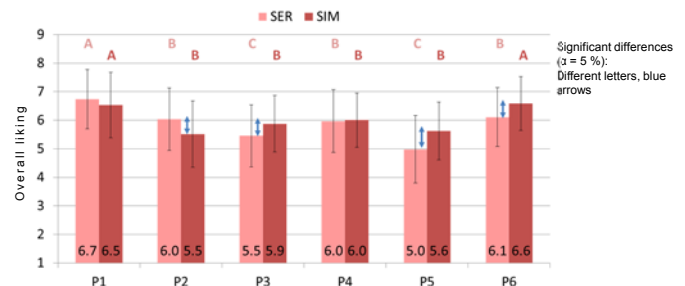


Figure 2: Overall liking of strawberry yoghurts in two different test designs. SER (N=189) and SIM (N=188).

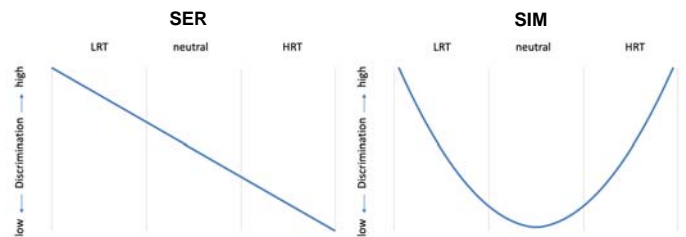


Figure 3: Product discrimination of the cognitive reflection groups in the serial monadic test. LRT n=49, neutral n=88, HRT n=52

Figure 4: Product discrimination of the cognitive reflection groups in the simultaneous test. LRT n=55, neutral n=89, HRT n=44

## Materials and Methods

Two experiments were conducted with 6 strawberry yoghurts and different test designs. The presentation design was serial monadic (SER) in Test 1 and simultaneous (SIM) in Test 2. The selection of the subjects was carried out in a two-stage recruitment process. In the first step consumers were screened and asked about their consumption habits concerning yoghurt (e. g. frequency). For the tests, participants were invited who were non-, light- and heavy users of strawberry yogurt. Subsequently a Cognitive Reflection Test (CRT) (Frederick 2005) was carried out with the participants. The principal of a CRT is that intuitive answers lead to incorrect results. This allows the consumers to be divided into two types, Low Reflection Thinkers (LRT) or High Reflection Thinkers (HRT). LRTs make their decisions more spontaneously, whereas HRTs give more reflected answers. Figure 1 shows one of the three questions of the CRT. The data were analysed using the Friedman test and the Dunn-Bonferroni method as post-hoc.

A bat and a ball cost \$1.10. The bat costs \$1.00 more than the ball. How much does the ball cost?

**Answer:** The first answer that comes to mind is 10 cents, but closer thinking makes you realise that the correct answer must be 5 cents.

Figure 1: Example of a Cognitive Reflection Test question. This is also known as the ball and the bat problem.

## Results

Figure 2 illustrates the differences between the two test designs. The consumers discriminated inconsistently between the two test designs and give fewer significant groups in the simultaneous design. Four product scores changed significantly between the two tests (identified by the blue arrows).

Figures 3 and 4 show the differences between the two thinking styles. HRTs discriminated the products less than the LRTs in the serial monadic test setup. In the simultaneous test both groups discriminate the products equally. People who do not fit into the two thinking styles form the neutral group.

The split of the user groups is shown in Figures 5 and 6. In total the non and light users discriminated the products less, whereas heavy users discriminated the products to a greater extent.

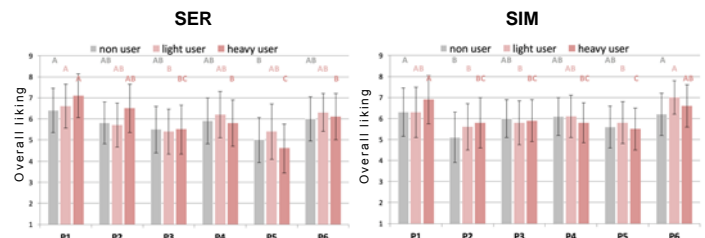


Figure 5: Product discrimination of the user groups in the serial monadic test. non user=52, light user n=62, heavy user n=75

Figure 6: Product discrimination of the user groups in the simultaneous test. Non user n=53, light user n=61, heavy user n=74

## Conclusion and perspectives

**Presentation design:** The results show that a serial monadic presentation design favours product discrimination compared to a simultaneous test design.

**Consumption frequency:** The user status was shown to have an impact on the discrimination ability. Heavy users show a bigger potential to discriminate between the products compared to low- or non users.

**Cognitive reflection type:** The results suggest that more spontaneous consumers show a better ability to discriminate compared to high reflection thinkers. Consequently, the initial hypothesis, which argued that the HRTs discriminate better, has been disproved by the experiments.

The results lead to the conclusion that consumer testing in a serial monadic setting, with heavy users and low reflection thinkers could increase product discrimination. To better investigate the impact of the presentation design, the consumption frequency and the cognitive reflection type the experiment should be repeated with a design that takes into consideration putative interactions between the factors.

