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Sensory analysis — Methodology — Paired comparison test

AMENDMENT 1

Analyse sensorielle — Méthodologie — Essai de comparaison par paires

AMENDEMENT 1

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Foreword

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The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 12, *Sensory analysis*.

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AMENDMENT 1

Page 15, Annex B, B.5.2

Replace B.5.2 with the following:

B.5.2 Analysis and interpretation of results

In Example 1 (one-sided paired test), the data were as follows: $n = 30$, $x = 21$, $\alpha = 0{,}05$. From these data, the analyst calculates

— $p_c = x/n = 21/30 = 0{,}7$,

— $\hat{p}_d$ (proportion of distinguishers) $= 2p_c - 1 = 2 \times 0{,}7 - 1 = 0{,}4$,

— s_d (standard error of p_d) $= 2\sqrt{\left(n \times x - x^2\right) / n^3} = 2\sqrt{\left(30 \times 21 - 21^2\right) / 30^3} = 0{,}167$, and

— 95 % one-sided lower confidence limit $= \hat{p}_d - z_\alpha s_d = 0{,}4 - 1{,}64 \times 0{,}167 = 0{,}125$.

The sensory analyst can therefore be 95 % certain that the proportion of consumers who perceive the prototype to be crispier than the control is larger than the proportion of consumers who perceive the control to be crispier than the prototype by at least 12 %. This result agrees with the conclusion given in Example 1, since it shows that the one-sided confidence interval does not contain the null value.

In Example 3 (two-sided paired difference test), the data were as follows: $n = 44$, $x = 32$, $\alpha = 0{,}05$. It follows that

— $p_c = x/n = 32/44 = 0{,}73$,

— $\hat{p}_d$ (proportion of distinguishers) $= 2p_c - 1 = 2 \times 0{,}73 - 1 = 0{,}45$,

— s_d (standard error of p_d) $= 2\sqrt{(n \times x - x^2) / n^3} = 2\sqrt{(44 \times 32 - 32^2) / 44^3} = 0{,}134$,

— 95 % upper confidence limit $= \hat{p}_d + z_{\alpha/2} s_d = 0{,}45 + 1{,}96 \times 0{,}134 = 0{,}71$, and

— 95 % lower confidence limit $= \hat{p}_d - z_{\alpha/2} s_d = 0{,}45 - 1{,}96 \times 0{,}134 = 0{,}19$.

The sensory analyst can therefore be 95 % certain that at least 19 % and at most 71 % of the population is capable of distinguishing the samples. This result concords with the conclusion given in Example 3, indicating sample A as being saltier, since it shows that the confidence interval does not contain the null value.

In Example 4 (two-sided paired similarity test), the data were as follows: $n = 120$, $x = 67$, $\beta = 0{,}05$ and the critical $p_d = 30$ %. In the two-sided case, the value of x is chosen to be the maximum of the two choice counts, regardless of which sample was chosen most often. The calculation therefore gives

— $p_c = x/n = 67/120 = 0{,}56$,

— $\hat{p}_d$ (proportion of distinguishers) $= 2p_c - 1 = 2 \times 0{,}56 - 1 = 0{,}12$,

— s_d (standard error of p_d) $= 2\sqrt{\left(n \times x - x^2\right) / n^3} = 2\sqrt{\left(120 \times 67 - 67^2\right) / 120^3} = 0{,}09$, and

— 95 % upper confidence limit = $\hat{p}_d + z_{\beta/2} s_d$ = 0,12 + 1,96 × 0,09 = 0,29.

The sensory analyst can therefore be 95 % certain that the actual proportion of the population capable of distinguishing the samples is no greater than 29 %. For the similarity test, the analyst chose the confidence level to be 100 (1 – β) = 95 %. Since 29 % is less than the pre-established limit (i.e. critical p_d = 30 %), the analyst can conclude with 95 % confidence that the samples are sufficiently similar in surface slip to be used interchangeably.

Since x was defined as the maximum choice count regardless of which sample received the higher count, only the upper-limit of the two-sided confidence interval needs to be calculated.

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