

## Title of the Paper

*Author A<sup>1</sup>\*, Author B<sup>2</sup>, Author C<sup>3</sup>*

### Abstract

In this study, The posterior probabilities of the hypotheses for comparison of parameters for any two cold drink brands are obtained.

**Keywords:** Bayesian rating, Regression model, Glenn–David model, Paired comparison models.

### 1. Introduction

It is consummated by assuming that when the difference between a judge's responses to two stimuli under comparison occur below a certain verge a tie will be acknowledged. This threshold and the mean stimulus responses are estimated by least square. Tutz and Schauburger (2015) suggested a generalization of PC model and use it for the assessment of game competitions (Csató, 2015).

$$f(y) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} \exp\left(-\frac{y^2}{2}\right) dy, \quad (1)$$

where,  $\theta_i$  and  $\theta_j$  are true treatment locations on the sensation range. Thurstone assumes no correlation between the treatment stimuli.

Table 1: Assumed values of hyper–parameters.

Set A		Set B	
$\mu_1 = 6$	$\sigma_1^2 = 0.5$	$\mu_1 = 7$	$\sigma_1^2 = 3$
$\mu_2 = 9$	$\sigma_2^2 = 0.5$	$\mu_2 = 8$	$\sigma_2^2 = 1$
$\mu_3 = 11$	$\sigma_3^2 = 0.5$	$\mu_3 = 9$	$\sigma_3^2 = 4$

### 2. Analysis of the model

To conduct the analysis under the subject model, five brands of cold drinks namely: PEPSI (PE) and CoCa Cola (CO), 7Up (SU), Sprite (SP) and Dew (DU) are considered.

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\*Corresponding author

<sup>1</sup>Affiliation of author A.

Email: authora@gmail.com

<sup>2</sup>Affiliation of author B.

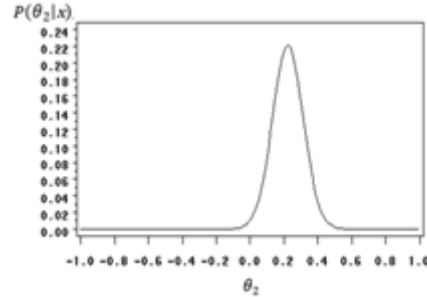
Email: authora@gmail.com

<sup>3</sup>Affiliation of author C.

Email: authora@gmail.com

## 2.1. Graphical representations

The graphical representation of the posterior densities of the cold drink parameters are presented in the following figures.



## Appendices

### A. Program for Posterior Mean of $\theta_1$ with JP for $m = 2$

```
DATA DD;
INPUT N012 N112 N212 DA DL;
CARDS;
3 8 19 0.0001 0.05;
PROC PRINT DATA=DD; RUN;
DATA CC; SET DD;
DO T1=-4 TO 4-DL BY DL;
DO D=DL TO 4-DL BY DL;
```

## References

- Csató, L. (2015). A graph interpretation of the least squares ranking method. *Social Choice and Welfare*, 44(1), 51–69. <https://doi.org/10.48550/arXiv.1508.06778>
- Tutz, G., & Schauburger, G. (2015). Extended ordered paired comparison models with application to football data from german bundesliga. *AStA Advances in Statistical Analysis*, 99(2), 209–227. <https://doi.org/10.1007/s10182-014-0237-1>