Causes and effects in Dichotomous Comparative Judgments: an information-theoretical system of plausible mechanism

Jose Manuel Rivera Espejo

Tine van van Daal

Sven De De Maeyer

Steven Gillis

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Abstract

(to do)

# Introduction

Over the past decade, numerous studies have documented the effectiveness of the *comparative judgment* (CJ) method (Thurstone 1927; Pollitt 2012a) for assessing competencies and traits. These studies have evaluated CJ from two main perspectives: its ability to produce reliable and valid trait scores, and its practical applicability. In terms of reliability and validity, research has shown that CJ can generate precise and consistent scores that accurately represent the traits being measured. Notable contributions in this research area include studies by Pollitt (2012b), Whitehouse (2012), van Daal et al. (2019a), Lesterhuis (2018), van Daal et al. (2019b), Bramley and Vitello (2019), Verhavert et al. (2019), Crompvoets, Béguin, and Sijtsma (2022), and Bouwer et al. (2023). Regarding practical applicability, several studies have highlighted the method’s versatility in both educational and non-educational contexts, presenting it as an efficient and effective alternative for measurement and evaluation. Key examples in this research area include the works of Jones (2015), Bartholomew et al. (2018), Jones et al. (2019), Marshall et al. (2020), Bartholomew and Williams (2020), and Boonen, Kloots, and Gillis (2020).

Nevertheless, despite the growing number of CJ studies, the research approaches employed in the literature have been unsystematic and non-integrated, leading to the oversight of several critical issues related to the method. These issues include concerns about the measurement model responsible for generating the CJ scores, the structural component used for further data analysis and hypothesis testing, and challenges related to the design of CJ experiments. For instance, a notable concern regarding the measurement model is the prevalent reliance on the assumptions of Case 5 from Thurstone’s law of comparative judgment (1927). Although Case 5 was originally articulated to produce a “rough measurement” or “rather coarse scaling” of traits (Thurstone 1927, 268–69), its assumptions have become predominant in the literature due to its implementation through the Bradley-Terry-Luce (BTL) model (Bradley and Terry 1952; Luce 1959). This leaves issues such as the presence of judge’ biases hinted by Bramley (2008) and Kelly, Richardson, and Isaacs (2022), and evidenced by Pollitt and Elliott (2003), (**Arlett\_2003?**), and (**Guthrie\_2003?**)

# Theory

## Let’s talk about Thurstone co.

## A scientific model for the CJ

## From theory to statistical model

# Discussion

## Findings

## Limitations and further research

# Conclusion

# Declarations

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# Appendix

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