A Comparison of Likert vs. Slider Formats in Clinical Assessment

Guyin Zhang, Dexin Shi & Amanda J. Fairchild
Department of Psychology, University of South Carolina

Contact Me

01 INTRODUCTION

Likert scales are thought to have some limitations such as:

- Yields **discrete and ordinal** data.
- **Uneven spacing** between response categories (Sideridis et al., 2023).
- **Loss of information** and lead to ceiling/floor effects (García-Pérez, 2024).

Sliders are thought to overcome the limitations of Likert scales since it yields **continuous data** directly (Funke & Reips, 2012; Voutilainen et al., 2016).

Are there differences in the performance of data from the two response formats on different **statistical indicators** and **model fit indices**?

02 OBJECTIVE

Compare five different response formats based on:

- Item-level scores
- Psychometric performance (structural validity; measurement invariance; reliability; criterion validity)
- Mean differences across genders
- Individual scores
- Subjective rankings

03 METHODOLOGY

The **short form of the *Center for Epidemiological Studies-Depression Scale*** **(CES-D 8)** was employed as the target instrument using five distinct response formats.

The study involved 400 participants, ranging in age from 18 to 86 years (M = 30.89, Mdn = 27, SD = 10.73). The sample was 37.3% male (n = 147), and 1.5% (n = 6) missing demographic data.

04 RESULTS

Results indicate that Likert and sliders demonstrated **similar patterns** regarding:

- Cronbach's alpha coefficient
- MacDonald's omega coefficient
- Criterion validity
- CFA model fit indices
- Standardized factor loadings

different patterns regarding:

- Measurement invariance
- Gender group mean difference
- Item scores
- Sum scores

05 TABLES/FIGURES

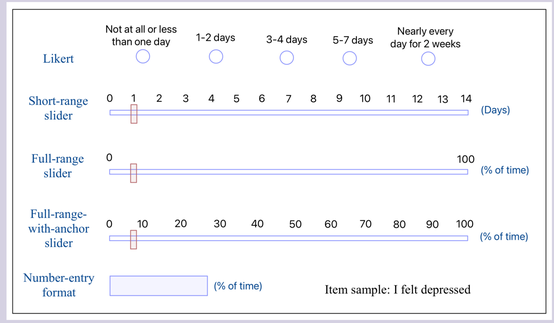

Figure 1. Illustrative layouts for Five Different Response Formats.

Table 1. Measurement Invariance of CES-D 8.

Format	Configural	Weak	Strong	Group mean
1	✓	✓	✓	≠
2	✓	✓	✓	=
3	✓	✗	-	-
4	✗	✗	✗	-
5	✓	✗	-	-

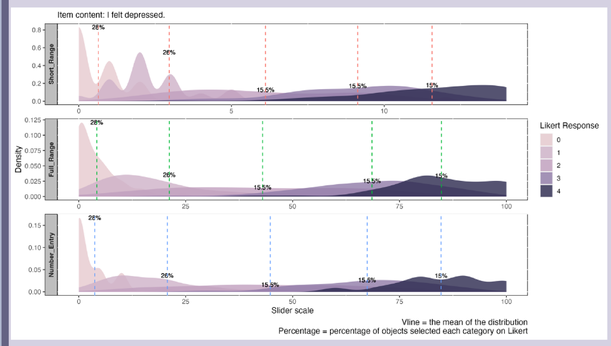

Figure 2. Merged Distribution Plot for Different Categories on Likert Vs. Other Response Formats for Negatively Worded Item.

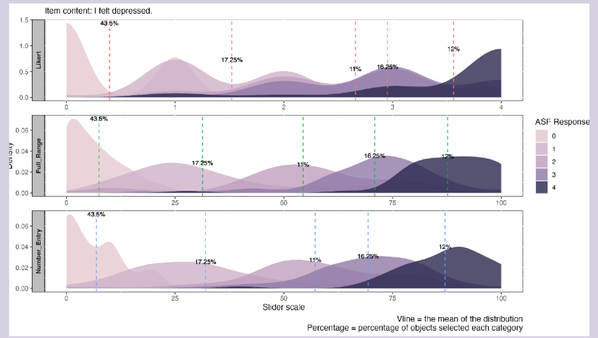

Figure 3. Merged Distribution Plot for Different Categories on ASF Vs. Other Response Formats for Negatively Worded Item.

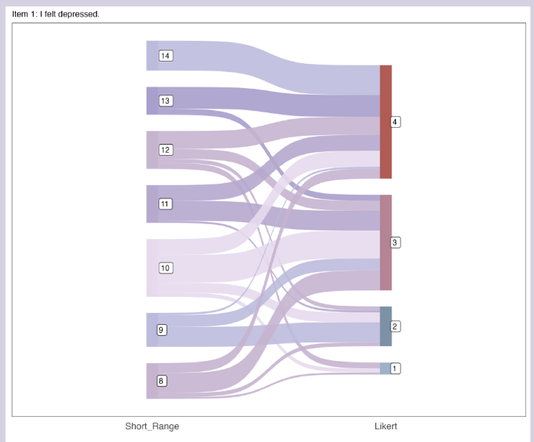

Figure 4. Sankey Plot for Negatively Worded Item on Short-Range Slider Vs. Likert.

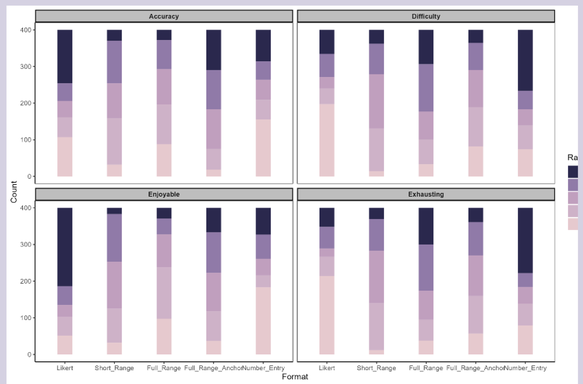

Figure 5. Stacked Bar Charts of Participants' Subjective Ranking for Different Response Formats.

06 CONCLUSION

1. We recommend employing a symmetrical design when crafting the response format of self-report questionnaire.
2. We recommend employing Likert scales for scale validation studies.
3. When utilizing frequency-type scales, we recommend retaining more response categories.
4. In cases where the frequency scale or range is extensive and collapsing of categories is necessary, we suggest employing equally spaced categories

07 LITERATURE

Sideridis, G., Tsaousis, I., & Ghamdi, H., 00131644221130482. (2023). Equidistant Response Options on Likert-Type Instruments: Testing the Interval Scaling Assumption Using Mplus. Educational and Psychological Measurement, 0(0), 1-22. https://doi.org/10.1177/00131644221130482

García-Pérez, M. A. (2024). Are the Steps on Likert Scales Equidistant? Responses on Visual Analog Scales Allow Estimating Their Distances. Educational and Psychological Measurement, 84(1), 91-122. https://doi.org/10.1177/00131644231164316

Funke, F., & Reips, U. D. (2012). Why semantic differentials in web-based research should be made from visual analogue scales and not from 5-point scales. Field methods, 24(3), 310-327. https://doi.org/10.1177/1525822X12444061

Voutilainen, A., Pitkäaho, T., Kvist, T., & Vehviläinen-Julkunen, K. (2016). How to ask about patient satisfaction? The visual analogue scale is less vulnerable to confounding factors and ceiling effect than a symmetric Likert scale. Journal of advanced nursing, 72(4), 946-957. https://doi.org/10.1111/jan.12875