Sama Radial Indicator (SRI) for Measuring Latent Variables

Dr. W. G. Samanthi Konarasinghe, [1], Dr. Edward Mariyani-Squire[2]

Western Sydney University, Australia[1, 2]

W.Konarasinghe@westernsydney.edu.au

ABSTRACT

Qualitative variables are not directly observed, therefore inferred from other, observable variables referred as hidden variables or Latent Variables (LV). The LV's are measured by multi-item scales, where an "item" is a question, and a "scale" is the resulting estimate of the LV. However, the polytomus item scales have some limitations: they have only few response options, sometimes the respondent gets confuse with the meaning of the response, the variables measured by these item scales are very unlikely to be normally distributed. Hence the LV's have many limitations in the data analysis. For example, the Likert 7 point scale including: "strongly agree, moderately agree, slightly agree, neutral, slightly disagree, disagree, and strongly disagree", has higher response options compared to a 5-point scale, but the respondent might not understand the difference between moderately agree and slightly agree. On the other hand, parametric hypothesis tests (Z-test, ANOVA etc.) are not applicable for analysing LV's, as they are not normally distributed. The Sama Radial Indicator (SRI) is developed to overcome the limitations of the existing item scales. The development of the SRI is based on the fundamental properties of a circle. It gives 180 response options and converts the psychometric ratings of respondents into a continuous scale. Hence the LV's or sampling distribution of the LV's are theoretically normally distributed. The "SRI" is tested on measuring the digital capabilities of organizations in the Hospitality & Tourism industry of Sri Lanka and found that the variables satisfy the normally criterian. It is recommended to apply SRI for more real life situations and test the efficiency of it.

Keywords: Qualitative variable, Latent variable, Item scale.