

Differential item functioning in online health-information seeking measurement

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Abstract

As digital health information becomes increasingly important in personal and public health decision-making, measuring internet usage for health-related purposes is crucial for understanding global digital health trends, which can contribute to designing policies and web-based tools. The International Social Survey Programme (ISSP) introduced a standardized questionnaire to assess online health information-seeking behaviour and collected data across diverse populations in 30 countries. Detailed item-level analysis, including detection of differential item functioning, may provide granular information on between-group differences across diverse populations.

In our work, we focus on testing differential item functioning (DIF) with respect to the country and age of the respondents to assess whether the questionnaire measures online health information-seeking behaviour consistently across different ages and nationalities and to better understand differences among respondents. If DIF is present, individuals with the same level of engagement but from various countries or age brackets may respond differently to certain items, which may remain unnoticed if the comparison is conducted based on total scores only.

Traditional DIF detection methods compare a fixed number of demographic groups, meaning that respondents would need to be divided into a fixed amount of age cohorts. However, such a grouping can lead to information loss and may fail to detect more complex DIF patterns. To address this, we introduce a new DIF detection method utilizing varying coefficient regression models, which allows for a more nuanced analysis of age-based DIF. These models enable us to test the statistical significance of DIF using submodel tests and to assess the practical significance of DIF by using area-based effect size measures. We apply our newly proposed method to the dataset and compare the results with those obtained by grouping age into cohorts. We also discuss differences with respect to countries.

Keywords

differential item functioning, regression models

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