

## **COMPARING ORDINAL REGRESSION WITH RASCH ANALYSIS IN AN OPTHALMIC CONTEXT**

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This research assesses item response theory (IRT) models applicable to ordinal data, specifically it compares the ordinal regression model with the Rasch rating scale model in an ophthalmic context to determine which model is optimal. Quality of life (QoL) instruments are often used by clinicians and researchers to attain self-reported health outcomes by patients partaking in clinical trials. Instruments generally consist of a list of questions (or items) to which patients' respond using an ordinal scale. Earlier methods of analysing ordinal data generated by patient responses include classical test theory (CTT) and IRT. Rasch analysis has now come to the forefront as an alternative technique and is thought to be the optimal modelling method for data of this kind. The WINSTEPS software used to perform the Rasch rating scale model described within this research allows for the examination of an instrument's psychometric properties including validity, reliability, domain structure as well as determining item redundancy and response scale adequacy. Ordinal regression can also provide results on validity and item redundancy and other statistical methods such as Cronbach's alpha and Factor analysis are required to determine validity and domain structure respectively. Data has been collected on patients with age-related macular degeneration (AMD) who have been administered an AMD specific QoL instrument known as the daily living tasks dependent on vision (DLTV). Both the ordinal regression and Rasch rating scale model have been applied to the given patient population and comparisons made of output from both methods.