

VALIDATION OF TWO DISEASE-SPECIFIC QUALITY OF LIFE QUESTIONNAIRES COMPARING A PARTIAL CREDIT MODEL AND A LATENT CLASS MODEL

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The pathology

- Peripheral arterial disease (PAD) is a cronical condition highly associated with cardiovascular morbidity
- In the last years, stability of symptoms and physical abilities has been observed
- Anyway significant improvements can be obtained for Quality of Life



The interviews

- The patients were recruited in the S. Giovanni Addolorata Angiology Day Hospital in Rome
- The questionnaires were administered to the same sample of patients (n=100)
- The sample was subjected to face-to-face interviews



The instruments

- *PAQ (Peripheral Artery Questionnaire)*
20 items and five domains: physical limitations, symptoms, social function, treatment satisfaction and overall quality of life
- *VASCUQOL (Vascular Quality of Life Questionnaire)*
25 items and five domains: pain, symptoms, activities, social and emotional functions



The methods

- *Partial Credit Model (PCM)*
- *Latent Class Model (LCM)*

Partial Credit Model

The probability of response to the category k of the item j by the subject i is given by

$$P_{ijk} = P(X_{ij} = x_{ij} / \theta_i, \beta_{jk}) = \frac{\exp[\sum_{k=0}^{x_{ij}} (\theta_i - \beta_{jk})]}{\sum_{h=0}^H \exp[\sum_{k=0}^h (\theta_i - \beta_{jk})]}$$

where $x_{ij} = 0, 1, \dots, h, \dots, H_j$, θ_i is the parameter representing the ability of the individual i to answer and β_{jk} the difficulty of the category k of the item j

Latent Class Model

- The probability of obtaining response pattern x , $P(X = x)$, is a weighted average of the K class-specific probabilities $P(X = x | \theta = t)$; that is,

$$P(X = x) = \sum_{\theta=1}^K P(\theta = t) P(X = x | \theta = t)$$

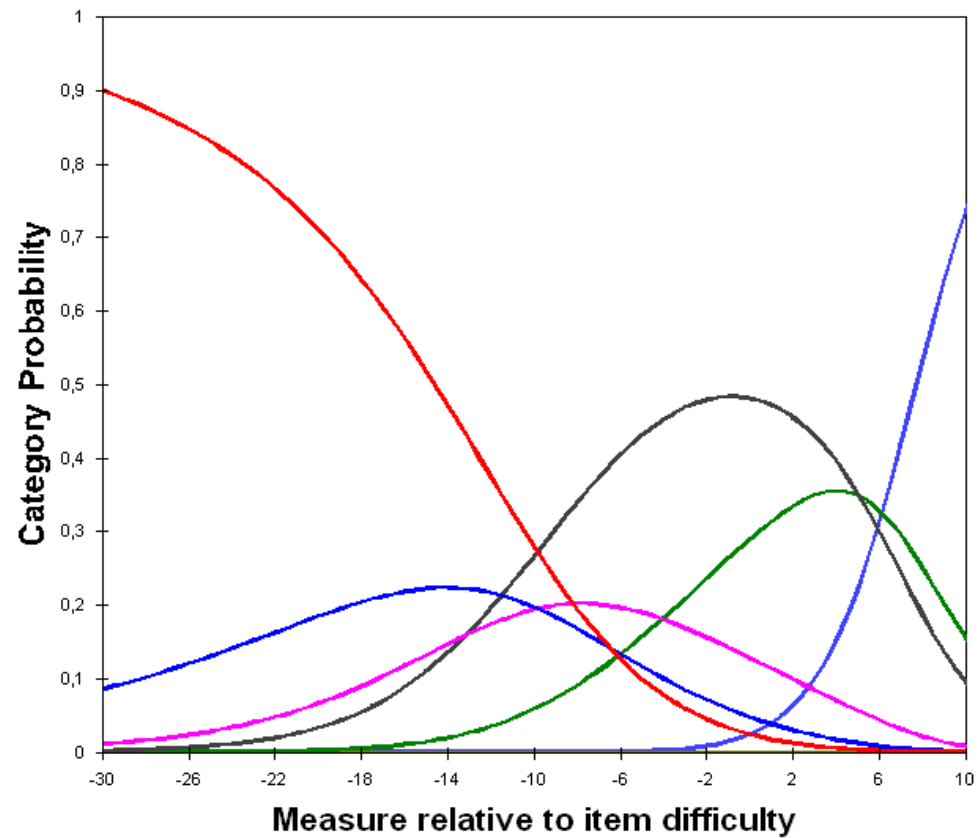
- We assume that subjects are divided into k clusters of approximately similar ability
- θ represents a discrete random effect variable which can take k possible values with a certain discrete probability distribution



The results: PCM

- The application of PCM identifies some relevant changes in the questionnaires structure:
 - the elimination of some items, which makes the QoL measurement worse
 - the organization of the response structure into three categories, instead of five, six or seven

Category Probability Curves (Paq)





The results: comparison between PCM and LC

The Bayesian Information Criterion leads to select the LCM with three classes as the best model for Paq, and the PCM as the best one for Vasquqol



Referencias

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