Determinant factors associated with the choice of university degrees in Spain through Principal Component and Factor analysis

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The Spanish public university access system is a complex process that revolves around two keys features: universities offering a limited number of places in a set of degrees and students generating a prioritized list of selected degrees. Under this operational scheme, it is of paramount importance to determine the reasons that motivate the first choice demand of a student in order for universities to undertake appropriate actions regarding the number of places of each degree.

An interesting approach tackles this problem as a multivariate model based on a series of structural relationships involving a set of variables related to social factors, individual factors and context data [1]. This study draws upon of a questionnaire of 25 items filled out by approximately 4400 students that was used to assess different aspects involved in the selection and access to the Spanish university system [2]. On the basis of the questionnaire dataset, we have carried out a study to restructure the data by reducing the number of variables that largely explain the information contained in the original dataset. First, we discover the linear combinations that reflect the most variation in the data through Principal Component Analysis. Second, we apply Exploratory Factor Analysis to uncover the underlying structure of the original data and then we test the hypothesized model with a Confirmatory Factor Analysis. The results will show that the original 25 questions of the questionnaire can actually be narrowed down to a few significant items.

[1] Antonio Hervás, Joan Guàrdia Olmos, Maribel Peró Cebollero, Roberto Capilla Lladró and Pedro Pablo Soriano Jiménez
A Structural Equation Model for Analysis of Factors Associated with the Choice of Engineering Degrees in a Technical University
Abstract and Applied Analysis, Vol. 2013, Article ID 368529 (2013)

[2] Maribel Peró, Pedro Pablo Soriano, Roberto Capilla, Joan Guàrdia i Olmos, Antonio Hervás

Questionnaire for the assessment of factors related to university degree choice in Spanish public system: A psychometric study