A STRUCTURAL EQUATION MODEL FOR ANALYSIS OF FACTORS ASSOCIATED WITH THE CHOICE OF DEGREES AND UNIVERSITY IN THE SPANISH PUBLIC UNIVERSITIES SYSTEM

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ABSTRACT

Many different factors are taken into account by students when choosing a degree and university. Some of these are general considerations, such as the quality of the degree course (ratio available places/places in first choice, cut-off mark, etc.) while others are subjective factors (e.g.: friends doing the same course). This paper presents a partial multivariate model that considers the weight of the different variables linked to this decision, as identified in the bibliography. We analyzed four samples of first-year students (total n = 1790) from different engineering degree courses at the Universitat Politecnica de Valencia (UPV) in the 2010-11 and 2011-2012 academic years. All the students involved in the study had chosen this university and their courses as their first option. The overall effect shows that the structural model adjusts reasonably well to the different engineering courses analyzed. Similarly, the individual models for each engineering degree manage to identify the different effects involved. In the case of the engineering degree based on new technologies (ICT) the statistical effects are much greater and more statistically significant than in the other three branches of engineering considered.

INTRODUCTION

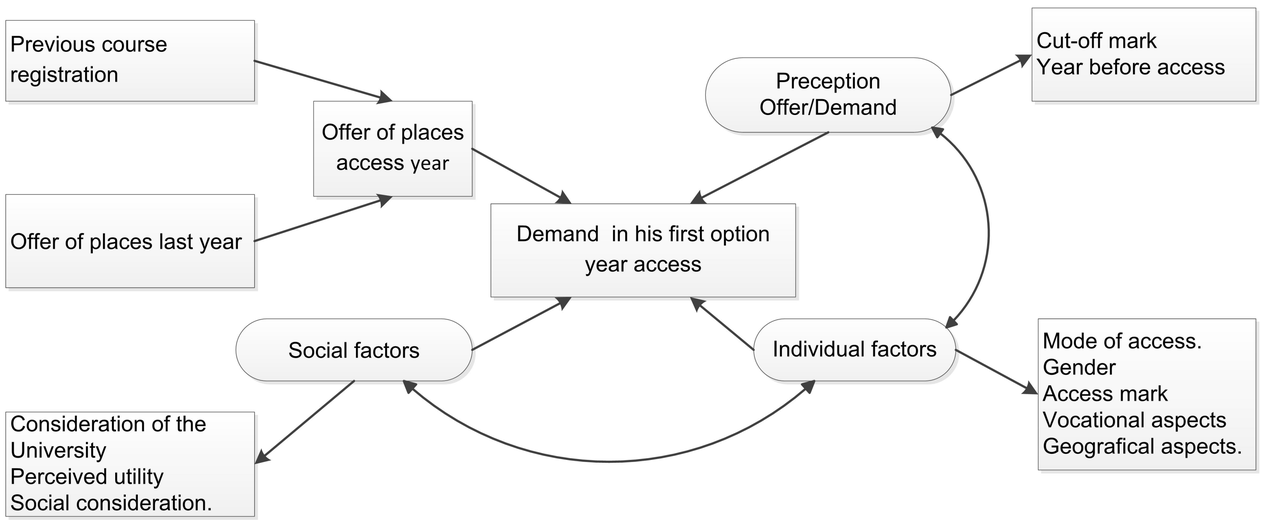
The question of which factors determine a student's selection of university and degree course has been the subject of debate for some time. Many specialists have opined on the subject with more or less structured inputs and empirical contributions to justify their positions.

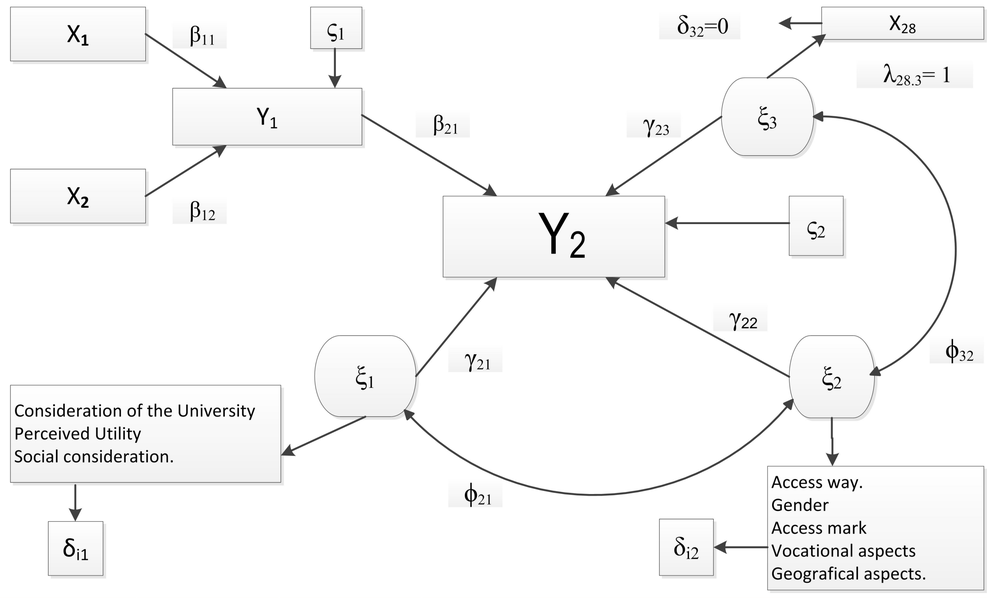
It is easy to obtain questionable but often-repeated evidence on the criteria used in selecting a university and study course. Arguments such as "my friends are also going", "It's close to home" or the well-known "the cut-off is low" are often cited. Studies such as those published by the Universidad Antonio de Nebrija (2001) (www.nebrija.com/servicios/publicaciones.php) or the Universitat Oberta de Catalunya (2001) (http://elcrps.uoc.edu/ojs/index.php/elcrps) show how most students use this type of argument at the expense of those that academic specialists would prefer them to use. These arguments must be understood in the Spanish social context, in which the family relationship is very strong, and usually university student, over 76.6 % at UPV live with their parents, and the homes and apartments for rent are used by students whose families live far from the university.

This issue has also been raised in Europe, where the universities (and even more so the universities of our immediate environment) have found that new students are highly motivated but are somewhat lacking in the necessary capacities. The European Access Network (EAN) (www.ean-edu.org) for example has been very active in this field. In the USA the tradition is very similar with the "slight" difference that recruitment systems are supposedly competitive, but are ultimately based on the financial resources of prospective students, very different from our policy of scholarships and student grants. In our system grants play a social role, while in the USA there is a policy of recruiting talent. Supporting evidence for this position can be found in the Hispanic Association of Colleges and Universities (www.hacu.net), whose aim is to incorporate Hispanic minorities in the American university system, based on the quality of the system and the 'trust' in the university. The situation described by Murphy and McGarrity is similar to the present situation in Spain and, as we have already said, can be clearly seen in some proven schemes, as in the case of Engineering or that of women in certain degrees or in exclusion-prone groups such as ethnic minorities.

Most authors agree on the relationship of the factors that determine the selection of a college or university and these are clearly identified in some of the works cited, as in. In fact, they are consistent with many of those proposed some time ago in various forums and have even been included in the general documents of the European Students Union (www.esib.org) to establish unsystematic models, somewhat more phenomenological than demonstrable. Many of the proposals are similar in type. First, it is considered that the demand for a degree and a university has a direct relationship with a factor generated from the subjective perception of this degree by students and their environment. The ratio between places and the demand for first choice is established from indirect indicators, as shown by the consolidation of the faculties and degrees most in demand. In more specific models, a certain longitudinal effect is admitted, so that the ratio between supply and demand in previous years is taken into account in the subjective perception of the present situation.

THE MODEL





$$Y_1 = \beta_{11}X_1 + \beta_{12}X_2 + \zeta_1$$
$$Y_2 = \beta_{21}Y_1 + \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \gamma_{23}\xi_3 + \zeta_2.$$

Finally, to conform to the general precepts and assumptions of structural equation models, we considered the following statistical assumptions for quantitative variables $E(X_i) = E(Y_i) = E(\xi_i) = 0$ and $Var(X_i) = Var(Y_i) = Var(\xi_i) = 1$. Consequently, all quantitative variables were transformed by reduction and standardization, and similarly $E(\varepsilon_i\varepsilon_j) = E(\delta_i\delta_j) = E(\xi\delta) = E(\eta\varepsilon) = E(\zeta_i\zeta_j) = 0$;; assuming initially that the errors of measurement were uncorrelated with each other, as in the case of the observable and latent variables. The categorical observable variables (type of baccalaureate and gender) were considered separately and subjected to an own estimation process described below.

For the sake of brevity, the structures of exogenous measurement models (Λ_x) are not included here. We adopted the correlations between exogenous variables (both observable and latent) that had been shown to be significant in previous pilot studies. In all cases, the exogenous measurement models specified in the model comply with the conditions for applying the usual order conditions. In addition, the proposed model meets the identification condition, since it presents positive degrees of freedom (degree of freedom df = 321).

START OF THE EFFECT ACCORDING TO THE MODEL IN FIGURE 1	END OF THE EFFECT ACCORDING TO THE MODEL IN FIGURE 1	PARAMETER	ENGINEERING FIELDS			
EFFECT FROM	EFFECT UNTIL		Agronomy	Construction	Information and communications technology	Industrial Engineering
Perception offer/demand in access year	Demand in first option access year	Γ_{23}	. 501 *	. 592 *	. 676 *	. 423 *
Previous course registration	Offer of places access year	β_{11}	. 198 *	. 335 *	. 644 *	. 216 *
Offer of places last year	Offer of places access year	β_{12}	. 218 *	. 321 *	. 612 *	. 299 *
Offer of places access year	First option year access demand	β_{21}	. 256 *	. 299 *	. 618 *	. 261 *
Social factors	Demand for first option in access year	Γ_{21}	. 399 *	. 441 *	. 649 *	. 381 *
Individual factors	Demand for first option in access year	Γ_{22}	. 643 *	. 678 *	. 612 *	. 551 *
Correlation between social and individual factors		Φ_{21}	. 512 *	. 571 *	. 623 *	. 493 *
Correlation between perception of offer and demand for places in first choice in the year prior to the year studied with individual factors.		Φ_{32}	. 621 *	. 699 *	. 679 *	. 612 *

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