

Persistence and Academic Expectations in Higher-Education Students

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Abstract

Background: The article focuses on the relationship between students' expectations and persistence in the context of higher education. It explores the role that high expectations play in increasing the probability of adult students' persistence, controlling for individual sociodemographic attributes, skills preparation, values, and commitments. **Method:** A multilevel logistic model was applied to data on 2,697 first-year students who were enrolled in 54 programmes at a Portuguese public university during 2015-2016. **Results:** The findings suggest that high academic expectations are relevant to older students, since such expectations increase their likelihood of persistence. Being admitted to their first-choice programmes and differences in their study habits also contribute to increasing the probability of persistence. In the presence of such motivational and behavioural attributes, we did not find statistically significant differences according to students' socioeconomic background or gender. Our results also suggest that the relationship between prior academic achievement and persistence varies randomly across programmes. **Conclusions:** This institutional research study gives evidence towards the relevance of taking into account the level of programmes/courses in order to support interventions that effectively meet the students' expectations and, thus, could increase the probability of persistence for all students entering HE.

Keywords: Higher Education; persistence; academic expectations, logistic multilevel model.

Resumen

Persistencia y Expectativas Académicas en Educación Superior.

Antecedentes: el artículo se centra en la relación entre expectativas y persistencia de los estudiantes en educación superior. Explora el papel que juegan las altas expectativas en el aumento de la persistencia, controlando los atributos sociodemográficos individuales, la preparación de habilidades, etc. **Método:** se aplicó un modelo logístico multinivel a los datos de 2.697 estudiantes de primer año que se matricularon en 54 programas en una universidad pública portuguesa durante 2015-2016. **Resultados:** las altas expectativas académicas son relevantes para estudiantes mayores, ya que aumentan su probabilidad de persistencia. Ser admitido en sus programas de primera elección y las diferencias en sus hábitos de estudio también contribuyen a aumentar la probabilidad de persistencia. En presencia de tales atributos motivacionales y de comportamiento, no encontramos diferencias estadísticamente significativas de acuerdo con los antecedentes socioeconómicos o el género de los estudiantes. Nuestros resultados sugieren que la relación entre el GPA de la escuela secundaria y la persistencia varía aleatoriamente entre programas. **Conclusiones:** la relevancia de tomar en cuenta el nivel de programas / cursos para apoyar intervenciones que satisfagan de manera efectiva las expectativas de los estudiantes y, por lo tanto, puedan incrementar la persistencia de los estudiantes que ingresan a la ES.

Palabras clave: enseñanza superior; persistencia; expectativas académicas; modelo logístico multinivel.

Despite the considerable effort expended into improving the quality of Portuguese higher education (HE) (Sin et al., 2017; Tavares et al., 2017), recent official statistics on graduation rates (Engrácia & Baptista, 2018) indicate that low completion rates run counter to the need for graduates to possess greater academic qualifications in response to the growing complexity of society and the labour market.

The Portuguese HE context is structured as a binary system. Universities are oriented towards the provision of solid academic

training, combining the efforts and responsibilities of both teaching and research, and providing graduate, post-graduate (master's and doctoral) degrees, and a certification of aggregation, which entails meeting an additional requirement for the position of full professor. Polytechnic institutions concentrate on vocational and advanced technical training and are professionally oriented. The great expansion of Portuguese HE that took place after the seventies in the last century has increased the heterogeneity of students in terms of their place of origin (urban or rural), schooling trajectory, and socioeconomic and cultural background. Normally, the transition from high school to HE occurs in students aged 16-19 years, and they are expected to have completed a bachelor degree by the age of 24. Access to HE is determined by numerous provisions that are defined annually by the Ministry of Science, Technology, and Higher Education. They include restrictions on the maximum number of students for each undergraduate programme

in both the public and private sectors. To gain access to public HE, students must rank a maximum of six choices composed of pairs of undergraduate programmes and HE institutions in descending order of preference. Such nationwide competition gives priority to students with higher high school GPAs, which are the weighted average of their performance in upper secondary education and on national exams. This system of admissions allows students with the highest GPAs to enrol in the programmes of their choice, that is, the more socially valued ones (Ferrão & Almeida, 2019b; Fonseca et al., 2014). In turn, attending first-choice university is also positively related to a students' GPA at the end of the first year of HE studies (Ferrão & Almeida, 2019a, 2019b), and being admitted to one's first-choice programme increases the probability of persistence in HE (Ferrão & Almeida, 2018).

The descriptive statistics of an analysis of the 2011/12 cohort of students enrolled in three-year programmes at public HE institutions ($n=41797$) show that, four years later, 53% of students who had been admitted to their first-choice programme had graduated, and only 38% of those who had been admitted to their sixth-choice programme had attained a degree (Engrácia & Baptista, 2018). Such percentages reveal that there is much work to be done at the institutional level by both individual academics and students so that, once enrolled, the students will 'remain and successfully complete their studies, and that they get as much out of them as they can' (Tight, 2020, p. 1). In the face of private and public investment in higher education, low completion rates represent a waste of human talent and potential for individuals as well as a loss for families and society (Aina, 2013; Davidson & Wilson, 2013; Esteban García et al., 2016; Ferrão & Almeida, 2019a; Montmarquette et al., 2001) and it is a cause of growing concern among academic institutions. Such concern – alongside the expansion of HE in recent decades – is perhaps the main reason behind the growth of HE research (Tight, 2018; Vincent-Lancrin, 2009). The understanding and debate on issues related to dropouts (e.g. attrition and the withdrawal process) has moved from being the student's responsibility to that of the university (Tight, 2020). Therefore, from the perspective of institutional research (Altbach, 2014), the phenomenon of students' persistence (or lack thereof) is of great relevance (Arias Ortiz & Dehon, 2013; Cabras & Mondo, 2018; Ching, 2012; Ferrão & Almeida, 2018). Research on dropout and other related outcomes highlights the influence of a long list of personal and institutional attributes, including, at the student level, those related to prior abilities and academic preparation, sociodemographic characteristics, attitudes and values, and external commitments, and, at the institutional level, support, feedback, involvement programmes, and institutional commitment (Davidson & Wilson, 2013; Esteban García et al., 2016; Ikuma et al., 2019; Mujica et al., 2019; Pascarella et al., 2004). As prior academic achievement is marked socially (Amaral & Magalhães, 2009; Ferrão & Almeida, 2019b), it is suggested that the democratisation of access for students from disadvantaged socio-cultural groups does not correspond to the success rates and completion of higher education.

The growing social diversification of HE students is thus a challenge for institutions that must structure ways of interacting with, and providing services to support, students with less-familiar social and personal references to HE (Shaw, 2013). Considering the demands and challenges of the university context, it is necessary to promote the development and mobilisation of the students' personal resources to ensure their academic success (Cabras &

Mondo, 2018; Casanova et al., 2018; Esteban et al., 2016; Mujica et al., 2019; Páramo Fernández et al., 2017). Research on the phenomenon of persistence among students in HE (Bernardo et al., 2017; Ferrão & Almeida, 2018; Ishitani, 2016; Johnson, 2008; Letkiewicz et al., 2014) and related concepts such as student retention, engagement, and dropout has been a mainstream topic in the field of Education (Tight, 2020) and Psychology (Rodgers & Summers, 2008; Wong & Kaur, 2018). Several authors (Ikuma et al., 2019; Johnson, 2008; Lohfink & Paulsen, 2005; Mujica et al., 2019; Yang et al., 2017) who have adopted an integrative theoretical approach in their empirical studies have considered individual-level characteristics in the analysis of students' persistence, including demographic variables like gender, age, and ethnicity; family background variables like income and educational attainment level; and academic preparation, which has mostly been measured by high school GPA or exam marks. Few studies have focused on the relationship between academic expectations and persistence. Academic expectations (AEs) is a construct that includes students' perceptions and aspirations related to their development in HE, with the aim of graduating and attaining a degree. Based on a sample of 134 undergraduate psychology students with mean age of 23.1, a correlational study demonstrated the connection between students' expectations and academic performance, showing that 'students who hold "realistic" expectations of independent study in higher education perform better than those who do not' (Nicholson et al., 2013, p. 294). However, the authors reported a possible caveat about spurious covariance between students' confidence and performance due to the lack of a prior academic performance variable. This implies the inclusion of a controlling variable for prior academic performance. In fact, despite the vast number of studies that have shown prior academic performance as a strong predictor of performance and, thus, persistence (Johnson, 2008), some other studies have apparently shown inconsistent results regarding such a relationship (Montmarquette et al., 2001). In this regard, Ferrão and Almeida (2018) show that the university entrance score is positively related to the probability of persistence but, when the variable that captures the admission condition in the undergraduate programme is included in the model, the fixed effect of the entrance score loses magnitude and it is no longer statistically significant at the level of 5%. This suggests that such relationship between the academic prior achievement and the probability of persistence may vary across programmes.

Diniz, Alfonso, Araújo, Deaño and colleagues (2018) explored the topic based on a sample of 701 Portuguese and Spanish first-year students aged 17 to 23, with a median age of 19. Students older than 23 were excluded. Their findings showed that men had higher expectations than women in five out of the seven dimensions and that the largest difference was detected in the dimension of training for employment and political engagement.

In general, studies show that students from families with higher socioeconomic status have a higher rate of persistence and degree completion (Arias Ortiz & Dehon, 2013; Ishitani, 2016). This situation may be associated with the fact that they acquire more academic competency in high school, meeting the curricular requirements of HE more easily. Alternatively, the difference may be associated with having attended courses with more social prestige or the fact that such students do not need to reconcile studies with work activities undertaken to finance them (e.g. Letkiewicz et al., 2014). In addition, tensions between AEs and educational objectives may explain dilemmas faced by academic

staff from the perspective of curriculum development (James, 2002), which is also related to prior performance and skills and, in turn, related to students' choices and preferences (Hemsley-Brown & Oplatka, 2015). Regarding the Portuguese HE context, Amaral and Magalhães (2009, p. 520) mention that 'there were a large number of study programmes that recruited more than 50% of their enrolment from among mature students [...]'. Some authors (e.g. Torres et al., 2010) mention that 21 year old students or older may have different AEs from students under that age. In fact, when the initial expectations of students do not materialise, the inherent frustration that is translated into a lower level of engagement may also explain lower persistence rates during the first year of studies (James, 2002). The findings reported by Ferrão and Almeida (2018) show that younger students have higher probability of persistence compared with older students. Without the need to maintain a job, such students can become involved in academic and social activities, which is not always the case for older students, who often must reconcile working hours with classes and study activities (Torres et al., 2010). The additional innovative contribution this study provides is insight into the interaction between age-related expectations and the probability of persistence in HE studies.

To the best of our knowledge, none of the studies conducted so far on the individual and institutional factors related to students' persistence have deeply explored the role of a students' academic expectations in relation to the mediating influence of the students' age.

In the context of the goals of the Europe 2020 strategy (EUROSTAT, 2013), which sets a target of higher education attainment of at least 40% of young adults, and the relative position of those who have chosen not to pursue higher education in Portugal (European Commission, 2013), increasing access to higher education for adult students brings new research questions (Amaral & Magalhães, 2009; Amorim, 2018; Merrill, 2015) to the field.

For the purpose of this study, we hypothesized that students' academic expectations relate to their probability of persistence and that such relationship is mediated by students' age, even after controlling the conditions of entrance into HE. We apply multilevel logistic models to microdata concerning students' persistence measured through observations of students enrolled for the first time in their first year at the University of Minho in the academic year 2015/16, and who reached the end of the year with a grade point average (GPA). That is to say, the students did not give up, did not suspend their studies, did not transfer to another programme or institution, and did not finish the school year without at least one curricular unit completed. The *proxy* for students' persistence is in line with other studies (Casanova et al., 2018), which suggest that the students' decision to remain or drop out is strongly influenced by their academic achievement. Casanova et al. (2018) measured students' persistence accordingly to the enrolment in the second-year of studies. The two data cohorts differ one another due the group of post-graduate students that we decided to exclude from our study.

Method

Participants

The sample consists of 2,697 first-year students who enrolled the University of Minho in 2015/16. We consider the following students' attributes: persistence (1: yes; 0: no), university entrance

score, first-choice admission (yes/no) in the institution and chosen undergraduate programme, gender (1: male; 0: female), trajectory of schooling assessed by the experience of early-grade repetition (0: yes; 1: no), and parents' education as a proxy for socioeconomic status. Most of the students are female (57%) and enrolled in their first-choice programme (59%) and college (72%). Almost half of the students (47%) enrolled in a STEM (science, technology, engineering, and mathematics) programme, with 17% enrolled in economics, administration, or public administration, 13% in the humanities, 10% in the social sciences, 8% in health or nursing; and 5% in law. The students' ages ranged from 16 to 61 years, with average of 18.9 years (SD = 3.6), and 91.9% were full-time students. Bearing in mind age categories, the distribution is unbalanced. That is 86.9% in the interval [16, 19], 8.1% in [20, 22], and 5% in [23, +] interval. The two older student groups represent 13.1%. Thus, we decided to keep two age cohorts, [16,19] and [20, +], for comparison purposes. Because they represent, respectively, the common-age group and the older-age group in the access into HE. Moreover, they may illustrate different behaviours as a result of learning different kind of life experiences.

The university entrance score is 152.4 (out of 200; SD = 18.93). Most students (83.3%) stated that they had consistently been promoted throughout their schooling trajectory, and 13.9% mentioned at least one repetition of a grade level. The distribution of students by parents' education showed that 34.4% of the students had parents with no more than basic education, and 15.7% had parents with at least one degree of higher education. Academic performance data (GPAs) were available for 72% of students. The lack of such data for the other cases (28%) was a result of various situations, such as failure in all curricular units, having dropped out, or having transferred to other institutions. Descriptive statistics for the subset of students with no academic scores at the end of the first year showed that they were generally older, more likely to have repeated a grade in primary or secondary school, and, on average, had lower grades upon university entrance.

Instruments

Academic Perceptions Questionnaire – Expectations. This instrument explored students' beliefs and aspirations regarding the transition to higher education. It combined cognitive and motivational aspects of the academic experience and covered several dimensions: (a) training for jobs and career development (i.e., Qualify to achieve professional success), (b) personal and social development (i.e., Gain self-confidence in my potential), (c) international student mobility (i.e., Spend some of my study time in another country), (d) political engagement and citizenship (i.e., Develop a critical view of the world), (e) social pressure (i.e., Complete my course to match my family's investment), (f) quality of training in the course (i.e., Achieve deepening knowledge in my course area), and (g) aspects related to living with others and social interaction (i.e., Participate in parties and socialize with colleagues). Students rated their agreement with an item on a 6-point Likert-type scale ranging from 1 (completely disagree) to 6 (completely agree). The reliability was considered adequate for all the dimensions of questionnaire with alpha coefficients ranging between .78 and .93 (Deaño et al., 2015). For the purpose of this study, a general factor of expectations was estimated using the first principal component given by a principal component analysis, and it explains 62% of the total variance. On average, the

expectations of adult students are lower with larger variability than younger students' expectations (SD = 1.6 instead of SD = 1).

Study Methods Grid. Considering their experiences in secondary school, students evaluated their study routines in six situations (i.e., taking notes in classes, following a weekly schedule, performing tasks within a defined timeframe, etc.). Students rated their agreement with each situation on a 6-point Likert-type scale ranging from 1 (*completely disagree*) to 6 (*completely agree*). For the purpose of this study, the first principal component given using the technique of principal component analysis was used as a global score for study methods, and it explains 55% of the total variance.

Socio-Academic Questionnaire. Students answered several short questions reporting personal information related to, for example, their previous academic trajectory, parents' academic degrees, and whether the programme and the university were their preferred ones.

Procedure

At enrolment into university, the students were informed of the study objectives. Students gave their free and informed written consent to participate and to be identified to match the data collected at entering moment (sociodemographic, academic expectations and study methods in secondary school questionnaires) and the data about academic achievement (grade point averages at the end of their first semester and year) from Academic Services of university. Students were assured of the confidentiality of the data, and that they were not obliged to participate or continue with the study, and could leave the study by expressing that wish.

Data analysis

Statistical modelling aimed to contribute to defining the profile of students who entered the university for the first time and reached the end of the year with a GPA, as a *proxy* for persistence, in comparison to students who, for any reason (suspension, dropout, transfer, or failure), did not obtain a grade point average by the end of the first year.

Considering the basic structure of an educational organisation, in this case, programmes are indexed by *j*, and students within courses are indexed by *i*. The response binary variable is the students' persistence. We applied a two-level random coefficient model with a logistic function, which is the one most commonly used in the social sciences. The probability of student *i* in programme *j* demonstrating persistence is denoted by $P(y_{ij} = 1)$, with $i = 1, \dots, n_j$, $j = 1, \dots, J$, where *J* is the number of courses (*J* = 54) and *n_j* is the number of students in programme *j*. We constructed the statistical model as follows:

$$\log \left[\frac{P(y_{ij} = 1)}{1 - P(y_{ij} = 1)} \right] = \beta_{0j} + \beta_1 x_{1(ij)} + \dots + \beta_{4j} x_{4(ij)} + \dots + \beta_{10} x_{10(ij)} \quad (1)$$

$$\beta_{0j} = \beta_0 + v_{0j} \quad (2)$$

$$\beta_{4j} = \beta_4 + v_{4j} \quad (3)$$

$$\begin{pmatrix} v_{0j} \\ v_{4j} \end{pmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \sigma_{v0}^2 & \sigma_{v04} \\ \sigma_{v04} & \sigma_{v4}^2 \end{bmatrix} \right)$$

In the first line of the model, the predictor variables, denoted by X1 through X10, constitute additive terms where the respective coefficients $\beta_1, \dots, \beta_{10}$ represent the fixed parameters related to each of the explanatory variables. These are defined as follows: X1 represents the student's study method, X2 represents the student's expectations, X3 is the first-order interaction term between expectations and age, X4 represents the student's university entrance score, and X5 and X6 represent the gender (1: Male; 0: Female) and age (1: age > 19; 0: otherwise) of students, respectively. X7 is a dummy variable indicating whether the students were admitted to the programme of their first choice, and the variable X8 represents the students' experience of grade repetition in basic education (1: No; 0: Yes). The variables X9 and X10 are dummies and refer to the level of education of parents or guardians: that is, X9 represents the group of students whose father and mother did not have more than a basic education, and X10 represents the group of students whose father and mother held higher education degrees. According to this design, the reference group consists of students whose parents hold any other combination in terms of level of education. With such a design, we have attempted to represent the lower tail of the parents' education distribution in X9 and the upper tail in X10.

In the second and third lines of the model, the coefficients related to the intercept and the variable X4 (student's university entrance score) are set to vary randomly across programmes according to a bivariate normal distribution with null mean and

variance-covariance matrix defined as $\begin{bmatrix} \sigma_{v0}^2 & \sigma_{v04} \\ \sigma_{v04} & \sigma_{v4}^2 \end{bmatrix}$.

We used MLwiN 2.31 statistical software (Rasbash et al., 2014) with the estimation procedure PQL2 (Goldstein & Rasbash, 1996). We set the parametrisation of level 1 variance to allow for extra-binomial variation (McCullagh & Nelder, 1989), and we considered missing values as occurring completely at random (Little & Rubin, 2002).

Results

Firstly, we fitted the multilevel logistic regression model to quantify the unconditioned relationship between students' AEs and probability of persistence. The results suggest that the association is positive and statistically significant at the level of 5%. Then, we included the additive terms in the linear predictor as given by the Equations (1), (2), (3) presented above. Table 1 presents the estimates of the fixed and random parameters. Such estimates are presented on the logistic scale. It also includes the odds ratio in order to easily quantify the strength of the association between the probability of persistence and each binary explanatory variable.

The fixed parameter estimates suggest that the main effect of AEs is not statistically significant. However, there is an interaction effect between AEs and age; that is, the main effect of expectations is not statistically different from zero in association with the probability of persistence (estimate = 0.001, S.E. = 0.072), but its interaction with students' age is statistically different from zero (estimate = 0.298, S.E. = 0.147). Thus, even though students aged over 19 show a lower probability of persistence (estimate = -1.626; S.E. = 0.191) than their younger colleagues, among those who have high expectations such an effect is attenuated. For instance, among students over 19 whose AEs are a standard deviation higher

Table 1
Estimates of Fixed and Random Parameters

Effect	Estimate	S.E.	t	Odds ratio
Fixed effects				
Constant	.402	.395	1.018	-
Expectations	.001	.072	0.014	-
Interaction: Expectations X Age >19	.298	.147	2.027*	-
Age > 19	-1.626	.191	-8.513*	.20
Z-entrance score	.172	.139	1.237	-
Study Methods	.139	.065	2.138*	-
Male vs. Female	-.195	.139	-1.403	.82
Course 1st option (Yes vs. No)	.581	.130	4.469*	1.79
Repetition at Basic Educ (No vs. Yes)	.886	.345	2.568*	2.43
Parents' education	-.140	.130	-1.077	-
Random Parameters				
Level 2: Course				
Var(constant)	1.174	.304	-	-
Var(Z-entrance score)	.498	.187	-	-
Covar(Z-entrance score / Constant)	.083	.167	-	-
Level 1: Student				
Extra-binomial	.944	.029	-	-

* p < .05

from the mean, the negative effect on the probability of persistence is reduced to -1.398 (-1.626 + 0.298). This means that high expectations are relevant to older students, since such expectations protect them and increase their likelihood of persistence compared to younger students or those with lower expectations. Figure 1 and Figure 2 illustrate the relationship between expectations and persistence (logit scale) based on the predictive model for students older than 19 and younger, respectively.

Furthermore, the fixed parameter estimates suggest that students' study methods influence their probability of persistence (estimate = 0.139, S.E. = 0.065). Thus, when the variable for study methods is included in the model, there is no statistically significant gender difference in the likelihood of persistence. In the way round, if the variable for study methods is omitted from the model, the gender

variable shows the difference that, in fact, seems to be attributable to study methods. This appears to be a very promising result, since "study methods" variable is likely to increase the probability of persistence in higher education in the short term, and, in addition, it may contribute to reduce the gender-related difference reported in the literature as well. The estimates that were obtained also confirm the effect of preference, or being enrolled in a first-choice programme (estimate = 0.581, S.E. = 0.13), and the long-term effect of failure in primary education (estimate = 0.886, S.E. = 0.345) on students' persistence.

Regarding the random parameters, the estimates show that the mean of the probability of persistence varies from programme to programme (β_0 level 2 variance estimate = 1.174). Moreover, the influence of university entrance scores on the probability of

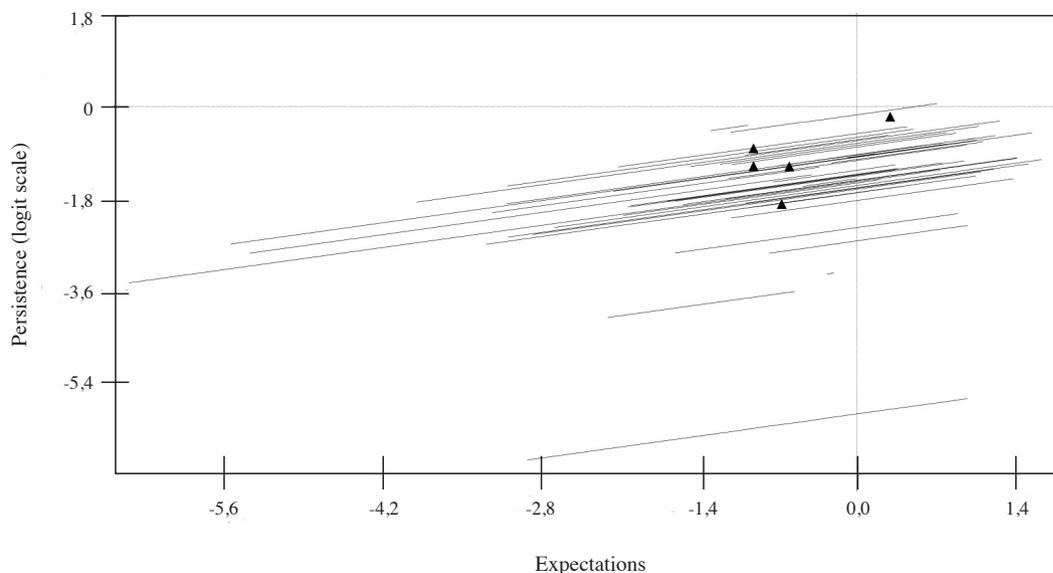


Figure 1. Persistence Given Expectations: Age > 19

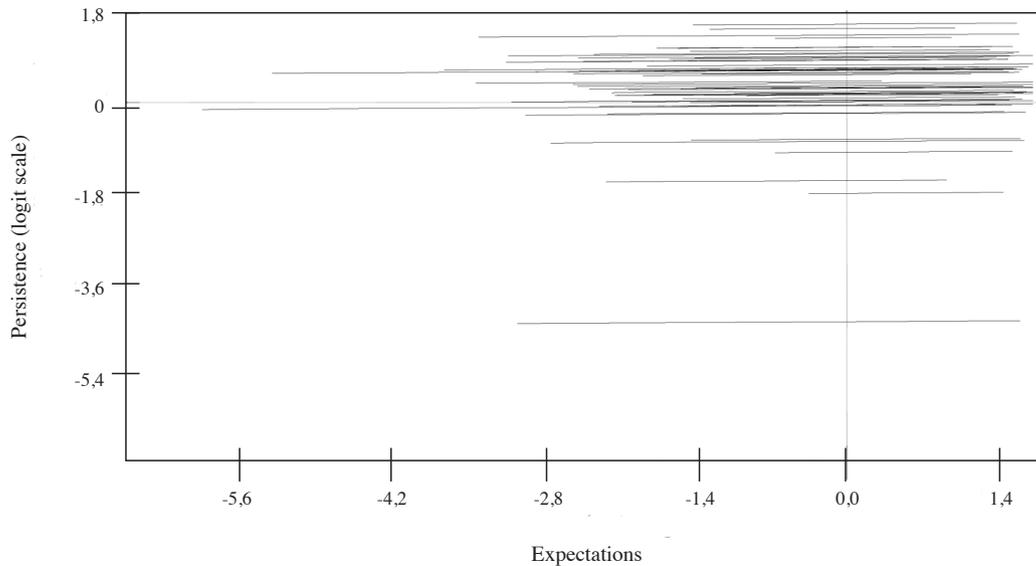


Figure 2. Persistence Given Expectations: Age ≤ 19

persistence also varies across programmes. The random parameter, or the variance associated with the slope coefficient of university entrance score, is statistically greater than zero (β_4 level 2 variance estimate = 0.498). The estimate of the extra-binomial parameter is close to 1 (estimate= 0.944; SE=0.029), meaning that the assumption of binomial variance, given the predictor variables, is adequate.

Discussion

In this study we applied multilevel logistic regression models to data collected from 2,697 first-year Portuguese students enrolled in a public university in 2015-2016, considering first-year demonstration of persistence as the dependent variable. The results are consistent with theoretical and empirical research concerning the influence of precollege characteristics on students' persistence in the first year of studies. The estimates show the relationship between university entrance scores based on secondary school averages combined with entrance examinations and the university and student persistence, which corroborates the results from other researchers (Esteban et al., 2016; Montmarquette et al., 2001; Naidoo & Lemmens, 2015). In addition, the data suggested that such a relationship varies randomly across courses after controlling for sociodemographic variables (age, gender, and parents' level of education) and the first-choice programme variable. Programme specificity is included in the model as random term, in accordance with the evidence given by Ferrão and Almeida (2018). They show that the prior academic achievement influences students' academic performance, as assessed by grade point average at the end of the first year, and that the magnitude of such an association depends on the programme and the area of study the student is attending. Such results are also in line with those of Masui et al. (2014), who demonstrated differential grading by field of study, and they support the idea that differential grading is possibly induced by departmental norms (Beenstock & Feldman, 2018). In turn, our results appear to agree with those obtained by Montmarquette et al. (2001). They showed that for students enrolled in any course with an entrance quota, which are, in general courses, more demanding from the point of view of academic requirements and

are mainly professional programmes (in law, business, or medicine), the probability of persistence is significantly higher than for students enrolled in sociology, anthropology, or economics programmes. Reinforcing the role of programme specificity, Georg (2009) also asserts that students do not consider dropping out due to stress or lack of ability but mainly poor commitment to their programme or area of study. In turn, our results also show the strong effect of being admitted to one's first-choice programme on persistence what is also present in literature (Casanova et al., 2018; Ferrão & Almeida, 2018; Mujica et al., 2019); in addition, our results show that high academic expectations contribute to increasing the probability of persistence in the age group older than 19 years. Thus, our working hypothesis was supported. Such evidence may capture the motivation and commitment of the student to finish the course successfully, and it corroborates findings reported in the literature that show that, the higher one's motivation and commitment, the less likely it is that he or she will drop out of higher education (English & Umbach, 2016; Esteban García et al., 2016; Ikuma et al., 2019). Students' preferences, motivation, commitment, and expectations have always been intricately interwoven. Since students' expectations must have some bearing on their motivations, expectations must, in turn, influence the quality of higher education (James, 2002) and, therefore, student retention. The direct implication of our findings is that there is a need for universities to address older students' expectations by reworking the undergraduate curriculum to meet their developmental expectations and place their best interests at the heart of teaching. Our results match the conclusion reached by Ortiz and Dehon (2013, p. 720)

that institutional surveys ...should measure the level of motivation or effort provided by the student because, in the end, if this variable explains a significant share of the probability of success and reduces the significance of socioeconomic background, it is a valuable argument in favor of having an open-access higher education system.

In fact, the linear predictor component of our model includes the additive term for parents' level of education as a proxy for

socioeconomic background, and the coefficient estimate is not statistically different from zero.

Regarding the relevance of study methods to persistence, our results appear to mirror the findings presented by Ishitani (2016); that is, the evidence reported supports the hypothesis that academic integration plays a vital role in student persistence. The assessment of academic integration conducted by Ishitani was based on how often students participated in study groups, met with an academic advisor, or talked with faculty about academic matters outside of class. Although it is not the same assessment instrument, there appears to be the same underlying construct related to study methods. Since the score we used was based on students' self-declarations about their past routines of study in secondary school, the dynamic of student integration in higher education may have slightly changed such routines. If so, study methods may play an even greater role in student retention, which we hope to clarify in future research.

In brief, this study contributes to research in the sub-area of higher education in an innovative way, specifically in regard to the subject of student persistence, by analysing and modelling the microdata of a large sample of students enrolled for the first time in their first year at an institution of HE; by taking into account the hierarchical structure of the data and thus simultaneously contemplating the statistical units of student and programme; and by considering individual sociodemographic variables, prior academic performance, and the conditions of admission to HE

as controlling variables that mediate the association between expectations, study methods, and the probability of persistence.

There are some limitations to be considered. Thus, caution is necessary to avoid generalising about the representativeness of the results. The study is limited by data available for analysis, and it involves the enrolment cohort of 2015-2016 of one public university. In order to obtain representative nationwide results, it would be very important to develop broader research involving samples from different cohorts of newcomers and multiple institutions. Moreover, the concept of students' persistence is operationalised through observations of students who reached the end of the first year with grade point average. It is reasonable to believe that, on the one hand, students who fulfill such requirement decide to leave in the next year anyway for other reasons and that, on the other hand, students in any of these situations are bound to abandon their HE studies. The literature on second-year persistence is scarce (Ishitani, 2016). Even though, it suggests that during the second year of studies, a different set of factors influence de students' decision of staying or leaving the HE institution. Further research is planned to investigate the persistence up to degree completion nationwide.

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References

- Aina, C. (2013). Parental background and university dropout in Italy. *Higher Education*, 65(4), 437-456. <https://doi.org/10.1007/s10734-012-9554-z>
- Altbach, P. G. (2014). The emergence of a field: Research and training in higher education. *Studies in Higher Education*, 39(8), 1306-1320. <https://doi.org/10.1080/03075079.2014.949541>
- Amaral, A., & Magalhães, A. (2009). Between Institutional competition and the search for equality of opportunities: Access of mature students. *Higher Education Policy*, 22(4), 505-521. <https://doi.org/10.1057/hep.2009.15>
- Amorim, J. P. (2018). Mature students' access to higher education: A critical analysis of the impact of the 23+ policy in Portugal. *European Journal of Education*, 53(3), 393-413. <https://doi.org/10.1111/ejed.12283>
- Arias Ortiz, E., & Dehon, C. (2013). Roads to Success in the Belgian French Community's Higher Education System: Predictors of Dropout and Degree Completion at the Université Libre de Bruxelles. *Research in Higher Education*, 54(6), 693-723. <https://doi.org/10.1007/s11162-013-9290-y>
- Beenstock, M., & Feldman, D. (2018). Decomposing university grades: A longitudinal study of students and their instructors. *Studies in Higher Education*, 43(1), 114-133. <https://doi.org/10.1080/03075079.2016.1157858>
- Cabras, C., & Mondo, M. (2018). Coping strategies, optimism, and life satisfaction among first-year university students in Italy: Gender and age differences. *Higher Education*, 75(4), 643-654. <https://doi.org/10.1007/s10734-017-0161-x>
- Casanova, J. R., Cervero, A., Núñez, J. C., Almeida, L. S., & Bernardo, A. (2018). Factors that determine the persistence and dropout of university students. *Psicothema*, 30(4), 408-414. <https://doi.org/10.7334/psicothema2018.155>
- Ching, G. S. (2012). Taiwan student engagement model: Conceptual framework and overview of psychometric properties. *International Journal of Research Studies in Education*, 1(1), 69-90. <https://doi.org/10.5861/ijrse.2012.v1i1.19>
- Davidson, C., & Wilson, K. (2013). Reassessing Tinto's Concepts of Social and Academic Integration in Student Retention. *Journal of College Student Retention: Research, Theory & Practice*, 15(3), 329-346. <https://doi.org/10.2190/CS.15.3.b>
- Diniz, A. M., Alfonso, S., Araújo, A. M., Deaño, M., Costa, A. R., Conde, Â., & Almeida, L. S. (2018). Gender differences in first-year college students' academic expectations. *Studies in Higher Education*, 43(4), 689-701. <https://doi.org/10.1080/03075079.2016.1196350>
- English, D., & Umbach, P. D. (2016). Graduate school choice: An examination of individual and institutional effects. *The Review of Higher Education*, 39(2), 173-211. <https://doi.org/10.1353/rhe.2016.0001>
- Engrácia, P., & Baptista, J. O. (2018). *Percursos no ensino superior: Situação após quatro anos dos alunos inscritos em licenciaturas de três anos* [Higher education pathways: Situation after four years of students enrolled in three-year degrees]. Direção-Geral de Estatísticas da Educação e Ciência.
- Esteban García, M., Bernardo Gutiérrez, A. B., Tuero Herrero, E., Cerezo Menéndez, R., & Núñez Pérez, J. C. (2016). El contexto sí importa: identificación de relaciones entre el abandono de titulación y variables contextuales [Context does matter: Identification of relationships between drop out and contextual variables]. *European Journal of Education and Psychology*, 9(2), 79-88. <https://doi.org/10.1016/j.ejeps.2015.06.001>
- European Commission (2013). *Europe 2020 target: Early leavers from education and training*. http://ec.europa.eu/europe2020/pdf/themes/29_early_school_leaving.pdf
- Ferrão, M. E., & Almeida, L. S. (2018). Multilevel modelling of persistence in higher education. *Ensaio: Avaliação e Políticas Públicas Em Educação*, 26(100), 664-683. <https://doi.org/10.1590/S0104-40362018002601610>
- Ferrão, M. E., & Almeida, L. S. (2019a). Differential effect of university entrance score on first-year students' academic performance in Portugal. *Assessment & Evaluation in Higher Education*, 44(4), 610-622. <https://doi.org/10.1080/02602938.2018.1525602>

- Ferrão, M. E., & Almeida, L. S. (2019b). Student's access and performance in the Portuguese Higher Education: Issues of gender, age, socio-cultural background, expectations, and program choice. *Avaliação: Revista Da Avaliação Da Educação Superior (Campinas)*, 24(2), 434-450. <https://doi.org/10.1590/s1414-40772019000200006>
- Fonseca, M., Dias, D., Sá, C., & Amaral, A. (2014). Waves of (Dis) Satisfaction: Effects of the numerus clausus system in Portugal. *European Journal of Education*, 49(1), 144-158. <https://doi.org/10.1111/ejed.12042>
- Georg, W. (2009). Individual and institutional factors in the tendency to drop out of higher education: A multilevel analysis using data from the Konstanz Student Survey. *Studies in Higher Education*, 34(6), 647-661. <https://doi.org/10.1080/03075070802592730>
- Goldstein, H., & Rasbash, J. (1996). Improved approximations for multilevel models with binary responses. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 159(3), 505-513. <https://doi.org/10.2307/2983328>
- Hemsey-Brown, J., & Oplatka, I. (2015). University choice: What do we know, what don't we know and what do we still need to find out? *International Journal of Educational Management*, 29(3), 254-274.
- Ikuma, L. H., Steele, A., Dann, S., Adio, O., & Waggenspack, W. N. (2019). Large-scale student programs increase persistence in STEM fields in a public university setting. *Journal of Engineering Education*, 108(1), 57-81. <https://doi.org/10.1002/jee.20244>
- Ishitani, T. T. (2016). Time-Varying Effects of Academic and Social Integration on Student Persistence for First and Second Years in College. *Journal of College Student Retention: Research, Theory & Practice*, 18(3), 263-286. <https://doi.org/10.1177/1521025115622781>
- James, R. (2002). Students' changing expectations of higher education and the consequences of mismatches with the reality. In *Responding to students expectations* (71-83). OECD Publishing. <https://doi.org/10.1787/9789264176225-en>
- Johnson, I. (2008). Enrollment, Persistence and Graduation of In-State Students at a Public Research University: Does High School Matter? *Research in Higher Education*, 49(8), 776-793. <https://doi.org/10.1007/s11162-008-9105-8>
- Letskiewicz, J., Lim, H., Heckman, S., Bartholomae, S., Fox, J. J., & Montalto, C. P. (2014). The path to graduation: Factors predicting on-time graduation rates. *Journal of College Student Retention: Research, Theory & Practice*, 16(3), 351-371. <https://doi.org/10.2190/CS.16.3.c>
- Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). John Wiley & Sons Inc.
- Lohfink, M. M., & Paulsen, M. B. (2005). Comparing the determinants of persistence for first-generation and continuing-generation students. *Journal of College Student Development*, 46(4), 409-428. <https://doi.org/10.1353/csd.2005.0040>
- Masui, C., Broeckmans, J., Doumen, S., Groenen, A., & Molenberghs, G. (2014). Do diligent students perform better? Complex relations between student and course characteristics, study time, and academic performance in higher education. *Studies in Higher Education*, 39(4), 621-643. <https://doi.org/10.1080/03075079.2012.721350>
- McCullagh, P., & Nelder, J. (1989). *Generalized linear models* (2nd ed.). Chapman & Hall/CRC.
- Merrill, B. (2015). Determined to stay or determined to leave? A tale of learner identities, biographies and adult students in higher education. *Studies in Higher Education*, 40(10), 1859-1871. <https://doi.org/10.1080/03075079.2014.914918>
- Montmarquette, C., Mahseredjian, S., & Houle, R. (2001). The determinants of university dropouts: A bivariate probability model with sample selection. *Economics of Education Review*, 20(5), 475-484. [https://doi.org/10.1016/S0272-7757\(00\)00029-7](https://doi.org/10.1016/S0272-7757(00)00029-7)
- Mujica, A. D., Villalobos, M. V. P., Bernardo Gutiérrez, A. B., Fernández-Castañón, A. C., & González-Pienda, J. A. (2019). Affective and cognitive variables involved in structural prediction of university dropout. *Psicothema*, 31(4), 429-436. <https://doi.org/10.7334/psicothema2019.124>
- Naidoo, A., & Lemmens, J. (2015). Faculty intervention as support for first-year students. *Journal of Student Affairs in Africa*, 3(2), 17-32. <https://doi.org/10.14426/jsaa.v3i2.133>
- Nicholson, L., Putwain, D., Connors, L., & Hornby-Atkinson, P. (2013). The key to successful achievement as an undergraduate student: Confidence and realistic expectations? *Studies in Higher Education*, 38(2), 285-298. <https://doi.org/10.1080/03075079.2011.585710>
- Páramo Fernández, M. F., Araújo, A., Vacas, C. T., Almeida, L. da S., & González, M. S. (2017). Predictors of students' adjustment during transition to university in Spain. *Psicothema*, 29(1), 67-72. <https://doi.org/10.7334/psicothema2016.40>
- Pascarella, E., Pierson, C., Wolniak, G., & Terenzini, P. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education*, 75(3), 249-284. <http://www.jstor.org/stable/3838816>
- Rasbash, J., Browne, W., Healy, M., Cameron, B., & Charlton, C. (2014). *MLwiN 3.0* [Computer software] (2.31). Centre for Multilevel Modelling, University of Bristol.
- Rodgers, K. A., & Summers, J. J. (2008). African American Students at Predominantly White Institutions: A Motivational and Self-Systems Approach to Understanding Retention. *Educational Psychology Review*, 20(2), 171-190. <https://doi.org/10.1007/s10648-008-9072-9>
- Shaw, A. (2013). Family fortunes: Female students' perceptions and expectations of higher education and an examination of how they, and their parents, see the benefits of university. *Educational Studies*, 39(2), 195-207. <https://doi.org/10.1080/03055698.2012.713549>
- Sin, C., Tavares, O., & Amaral, A. (2017). The impact of programme accreditation on Portuguese higher education provision. *Assessment and Evaluation in Higher Education*, 42(6), 860-871. <https://doi.org/10.1080/02602938.2016.1203860>
- Tavares, O., Sin, C., Videira, P., & Amaral, A. (2017). Academics' perceptions of the impact of internal quality assurance on teaching and learning. *Assessment and Evaluation in Higher Education*, 42(8), 1293-1305. <https://doi.org/10.1080/02602938.2016.1262326>
- Tight, M. (2018). Higher education journals: Their characteristics and contribution. *Higher Education Research & Development*, 37(3), 607-619. <https://doi.org/10.1080/07294360.2017.1389858>
- Tight, M. (2020). Student retention and engagement in higher education. *Journal of Further and Higher Education*, 44(5), 689-704. <https://doi.org/10.1080/0309877X.2019.1576860>
- Torres, V., Gross, J., & Dadashova, A. (2010). Traditional-age students becoming at-risk: Does working threaten college students' academic success? *Journal of College Student Retention: Research, Theory and Practice*, 12(1), 51-68. <https://doi.org/10.2190/CS.12.1.d>
- Vincent-Lancrin, S. (2009). *What is changing in academic research? Trends and prospects. Higher Education to 2030*. OECD Publishing. <https://dx.doi.org/10.1787/9789264040663-en>
- Wong, Z. Y., & Kaur, D. (2018). The role of vocational identity development and motivational beliefs in undergraduates' student engagement. *Counselling Psychology Quarterly*, 31(3), 294-316. <https://doi.org/10.1080/09515070.2017.1314249>
- Yang, X., Wang, X., Zhang, L., & Weidman, J. C. (2017). Gender role conflict, professional role confidence, and intentional persistence in engineering students in China. *Studies in Higher Education*, 42(2), 248-263. <https://doi.org/10.1080/03075079.2015.1045476>