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LITERACIA FINANCEIRA EM PORTUGAL: O CASO DOS ALUNOS INSCRITOS PELA PRIMEIRA VEZ NO ENSINO SUPERIOR

FINANCIAL LITERACY IN PORTUGAL: A STUDY ON FIRST-YEAR COLLEGE STUDENTS

EDUCACIÓN FINANCIERA EN PORTUGAL: EL CASO DE LOS ESTUDIANTES MATRICULADOS POR PRIMERA VEZ EN LA EDUCACIÓN SUPERIOR

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RESUMO

Introdução: A literacia financeira tem estado em foco nas últimas décadas. Alguns estudos referem que Portugal está aquém de outros países europeus em termos de literacia financeira. Assim, é importante desenvolver estudos que possam contribuir para a compreensão deste fenómeno.

Objetivo: Avaliar o nível de literacia financeira dos estudantes universitários portugueses do primeiro ano, considerando o impacto da idade, do género, da formação académica e da escolaridade dos pais.

Métodos: Amostra constituída por 255 respostas de estudantes portugueses que frequentam cursos de licenciatura. Foi utilizado um modelo de regressão logística para avaliar se a idade, o género, a formação académica e a escolaridade dos pais impactam as probabilidades de ter um elevado nível de literacia financeira.

Resultados: 62,4% dos alunos apresentam um baixo nível de literacia financeira. Além disso, a idade, ser homem e ter escolhido um curso na área das ciências económicas como primeira opção na candidatura ao ensino superior têm um impacto positivo nas probabilidades de ter um elevado nível de literacia financeira.

Conclusão: Este estudo contribui ao considerar o impacto de variáveis importantes no nível de literacia financeira, o que permite aos governos realizar intervenções políticas mais específicas. Os indivíduos presentes são jovens, o que significa que poderá ser mais fácil intervir. Estudantes do sexo feminino que não escolheram um curso na área das ciências económicas como primeira opção quando se candidataram à universidade são mais vulneráveis.

Palavras-chave: literacia financeira; estudantes universitários; vulnerabilidade do consumidor; Portugal

ABSTRACT

Introduction: Financial literacy has been in focus during the last decades. Some studies report that Portugal ranks in one of the worst positions in the European Union in terms of financial literacy. Thus, it is important to develop studies that could contribute to a better understanding of this phenomenon.

Objective: Assess the level of financial literacy of Portuguese first-year college students, considering the impact of age, gender, academic background, and parents' education.

Methods: The sample comprises 255 responses from Portuguese students attending bachelor's courses. A logistic regression model was used to evaluate if age, gender, academic background, and parents' education impact the odds of having a high level of financial literacy.

Results: 62,4% of the students have a low level of financial literacy. Moreover, age, being a man, and having chosen a business-related course as the first option when applying for higher education systems positively impact the odds of having a high level of financial literacy.

Conclusion: This study contributes by considering the impact of important variables on the financial literacy level, which allows governments to make policy interventions targeted at enhancing financial literacy. This group of individuals is relevant because most have not made any major financial decisions, and it is still possible to intervene. The most vulnerable individuals are female students who didn't choose a business-related course as their first option when applying for college.

Keywords: financial literacy; college students; consumer vulnerability; Portugal

RESUMEN

Introducción: La educación financiera ha estado en el centro de atención en las últimas décadas. Algunos estudios informan que Portugal va a la zaga de otros países europeos en términos de educación financiera. Por ello, es importante desarrollar estudios que puedan contribuir a comprender este fenómeno.

Objetivo: Evaluar el nivel de alfabetización financiera de estudiantes universitarios portugueses de primer año, considerando el impacto de la edad, el género, los antecedentes académicos y la educación de los padres.

Métodos: Muestra compuesta por 255 respuestas de estudiantes portugueses que cursan estudios de grado. Se utilizó un modelo de regresión logística para evaluar si la edad, género, antecedentes académicos y educación de los padres influyen en las probabilidades de tener un alto nivel de alfabetización financiera.

Resultados: 62,4% de los estudiantes tiene un bajo nivel de alfabetización financiera. Además, la edad, ser hombre y haber elegido un curso de ciencias económicas como primera opción al postularse a la universidad inciden positivamente en las probabilidades de tener un alto nivel de alfabetización financiera.

Conclusión: Este estudio contribuye al considerar el impacto de variables importantes en el nivel de educación financiera, lo que permite a los gobiernos llevar a cabo intervenciones de políticas más específicas. Los individuos presentes son jóvenes, lo que significa que puede ser más fácil intervenir. Las estudiantes que no eligieron un curso de ciencias económicas como primera opción al postularse a la universidad son más vulnerables.

Palabras clave: alfabetización financiera; estudiantes universitarios; vulnerabilidad del consumidor; Portugal

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INTRODUCTION

Financial literacy has been in focus during the last decades. Several authors, organizations, and authorities (e.g., United Nations) have stated that financial literacy plays a crucial role in the economic development of a given region or country and, as a consequence, in people's living conditions (Alessie et al., 2011; Organisation for Economic Co-operation and Development (OECD), 2015; Faulkner, 2022).

Recently, some studies have found that Portugal has a concerningly low level of financial literacy, being one of the worst countries in Europe (Allianz, 2017; Organisation for Economic Co-operation and Development (OECD), 2020; ECB, 2021; Organisation for Economic Co-operation and Development (OECD), 2023; Sarabando et al., 2023). Therefore, it seems essential to contribute to understanding what influences the level of financial literacy and who is more likely to have worse knowledge in this field.

This study surveys 255 first-year college students to examine their financial literacy and the impact of demographic and educational characteristics on financial literacy. Logistic regression and descriptive statistics were used to carry out the analysis. Results show that most students have a low level of financial knowledge. Their area of formation in high school or their mother's education level does not significantly influence students' literacy. Still, a significant and positive impact is observed if their fathers have a college degree. The study further identified that age, gender, and area of knowledge of the college degree significantly impact the financial literacy level.

These conclusions may lead to new initiatives from policymakers, academics, and organizations whose work is related to financial literacy. The findings provide the possibility of identifying the most vulnerable groups of people regarding financial literacy. Consequently, it is possible to plan more tailored approaches to improve financial knowledge, and thus try to avoid social exclusion and other adverse outcomes associated with low financial literacy.

This paper proceeds as follows: in section 2, there is a literature review about financial literacy and its relation to the factors in focus (age, gender, academic background and parents' education); section 3 explains the methodology regarding the data collected, the variables and the statistical model; in section 4 is presented the results and a critical analysis of it; and in section 5 could find the main conclusions of this study and some future research suggestion.

1. THEORETICAL FRAMEWORK

1.1. Financial literacy and age

Age is one of the main studied determinants regarding its impact on financial literacy (Zaimovic et al., 2023). In this sense, Jorgensen and Savla (2010) found that first-year students have a lower level of financial literacy than senior-year students, which could indicate that older students are more aware of financial issues, as discussed by the authors. Within the French context, Le Fur and Outreville (2022) found similar results since older students had a better level of financial literacy. Santos et al. (2022) documented that, in Portugal, there is a difference between people under 27 and those in the 27-37-year-old group, as the younger group is less conscious about long-term savings and its importance. Lusardi and Mitchell (2011) and Henager and Cude (2019) documented a positive relationship between the level of financial literacy and age.

In turn, Bansal and Kaur (2023) stated that people aged 25-45 years old have a higher level of financial literacy (compared to younger and older people). Bucher-Koenen and Lusardi (2011) found a hump-shaped pattern in the relationship between financial literacy and age. Okamoto and Komamura (2021) stated that financial literacy increases until the early 60s and then declines. Van Rooij et al. (2011) found similar results, concluding that middle-aged respondents know more about financial matters than younger or older respondents. In fact, Finke et al. (2017) found that after the age of 60, financial literacy scores begin to decrease due to a natural decline in fluid and crystallized intelligence.

On the other hand, Jacobsen and Correia (2019), considering a sample composed of undergraduate students from a US university, found that age is not statistically significant in terms of the impact on the level of financial literacy. Joo and Grable (2004) also state that age plays no role in justifying financial literacy.

Considering the conclusions presented by the authors cited above, it seems that most of them found a significant positive impact of age on financial literacy. Thus, we formulate the following hypothesis:

H1: Age has a positive impact on the level of financial literacy.

1.2. Financial literacy and gender

It is of extreme importance to reduce gender inequalities. Regarding financial literacy, many reasons could explain the importance of reducing gender differences, such as the fact that women live longer and are likely to be in widowhood for a couple of years, as discussed by Bucher-Koenen et al. (2017). A study conducted by the European Union in 2019 (European Union, 2019) documented that men generally show a higher level of financial literacy, despite wide differences between countries, since in some of them, women are more financially literate.

Lusardi and Mitchell (2011) stated that, in the United States of America, women have a lower level of financial literacy, being more prone to say they do not know the answer to questions about financial issues. In Brazil, Potrich et al. (2015) found that men have a higher level of financial literacy on average. Potrich et al. (2018), also focusing on Brazil, documented that women have a lower level of financial literacy and that among single women it is worse than among married women – in addition to the fact that women's level of financial literacy is positively related to the level of income and education. Chen and Volpe (1998), Lusardi and

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Mitchell (2008), Bucher-Koenen and Lusardi (2011), Lusardi and Mitchell (2011), van Rooij et al. (2011), Fonseca et al. (2012), Agnew and Harrison (2015), Bucher-Koenen et al. (2017), Jacobsen and Correia (2019), Lind et al. (2020), Okamoto and Komamura (2021), Blaschke (2022), and Bansal and Kaur (2023) are aligned with that, stating that the level of financial literacy is lower among women compared to men.

In turn, Santos et al. (2022) concluded that, in Portugal, although men are fonder of numeric calculations, women have a higher level of awareness regarding savings and their importance compared to men, which could be justified, as discussed by the authors, by the fact that, in Portugal, there are more women in the higher education system than men, a tendency that started in the 1980s, and something transversal to industrialized societies (Wells et al., 2011, as cited in Tinghög et al., 2021). However, similar results were found by Jayaraman and Jambunathan (2018), in India, a completely different country regarding women's education – as argued by the authors, the women's involvement in the daily management of family life (and therefore finances) could be the reason for a better score in terms of financial literacy.

On the other hand, Le Fur and Outreville (2022) documented that gender plays no role in justifying the financial literacy level, considering a sample of 300 students from a French business school. Joo and Grable (2004), Jorgensen and Savla (2010) and Cwynar (2021) are aligned with that, finding no significant difference between genders regarding the level of financial literacy.

Considering the conclusions presented by the authors cited above, it seems that most of them found that men have a higher level of financial literacy than women. Thus, we formulate the following hypothesis:

H2: Men have a higher level of financial literacy than women.

1.3. Financial literacy and the area of the academic background

Several authors have studied the impact of the area of academic background on the level of financial literacy. Focusing on eight European countries, Ergün (2018) concluded that students from a business department are more prone to have a higher level of financial literacy. In the Portuguese context, Santos et al. (2022) found that people with training in the areas of finance, accounting, economics, and similar show a higher level of financial literacy, while Almeida and Costa (2023) stated that students from courses related to administration and management have a higher level of financial literacy compared to engineering students. Considering different regions and countries, Chen and Volpe (1998), Jayaraman and Jambunathan (2018), Nikonova et al. (2018), Jacobsen and Correia (2019), Antoni et al. (2020), Le Fur and Outreville (2022) are aligned with that, stating that students from the business field have a higher level of financial literacy.

On the other hand, Agnew and Harrison (2015) found that studying business positively impacts financial literacy in New Zealand but has no impact on financial literacy in England. Kubicková et al. (2019) documented that students who enrolled in a business-related course are not more prone to show a higher level of financial literacy.

Considering the conclusions presented by the authors cited above, it seems that most of them found that students from a business-related course have a higher level of financial literacy than students from other fields. Thus, we formulate the following hypotheses:

H3a: Students who attended a course within socioeconomic sciences in secondary school have a higher level of financial literacy.

H3b: Students who chose a business-related course as the first option when applying for higher education system have a higher level of financial literacy.

1.4. Financial literacy and parents' education

There are several responsible drivers for the learning of young adults when it comes to financial issues. Within a world in which social media can be used for plenty of purposes, it seems that parents still can play an important role in young people's level of financial literacy (Lusardi et al., 2010; Moreno-Herrero et al., 2018; Duarte et al., 2022). Observing Moreno-Herrero et al. (2018), the parents' role seems to be the most important one, aiming to improve teens' knowledge about financial matters, since those who demonstrated a higher level of financial literacy were the ones who talked more often with parents about money. Indeed, several studies have stated the financial socialization concept, which is characterized by individuals learning about finance, not only concerning technical knowledge, but also regarding attitudes and behaviors (Ameer & Khan, 2020), and include various channels such as work or school, even considering the more significant role of family environment (Shim et al., 2010; Totenhagen et al., 2015). In a highly cited and important study on this matter, Lusardi et al. (2010) found that mothers' education has a significant impact on the level of financial literacy of young people, showing that having a mother with a college degree is associated with a higher level of financial literacy. Almeida and Costa (2023) and Chambers et al. (2019) also found a positive relationship between parents' education and the level of financial literacy.

On the other hand, Kadoya and Khan (2020) stated that parents' education does not affect financial literacy in Japan, while Jayaraman and Jambunathan (2018) documented that parents' education is negatively related to the level of financial literacy.

Thus, it seems reasonable to formulate the following hypotheses:

H4a: The father's education level has a positive impact on the level of financial literacy.

H4b: The mother's education level has a positive impact on the level of financial literacy.

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2. METHODS

2.1 Data

The main goal of this study is to investigate the impact of demographic and educational characteristics on financial literacy. The measurement of financial knowledge was developed based on a questionnaire that covers topics such as the time value of money, economic concepts, loans, and interest rates, adapted to the Portuguese reality (Sarabando et al., 2023).

The current study uses a survey approach, with a sample of 255 first-year college students, and was conducted using an online questionnaire (disseminated among the students with the support of other higher education institutions). Questionnaires were applied from September to November 2022. The sampling method used was convenience sampling. A total of 464 valid responses were obtained, but only 255 were from first-year college students, so only these were considered for the subsequent analysis, since we aim to investigate what people who haven't studied beyond compulsory schooling know about personal finance; thus it would make no sense to consider students who already have some kind of experience in the higher education system.

The sample profile includes students from several Polytechnic Institutes in Portugal. They are aged between 17 and 58 years, with an average of 21.4 years and a standard deviation of 7.2 years. About 80% are aged between 17 and 21 years. Most of the participants were male (57.6%), and 42.4% were female.

2.2 Variables

To assess the theoretical hypotheses formulated above, several dichotomous, categorical, and continuous variables were considered, which are presented in Table 1. This study will analyze the financial literacy of students who are in their first year of college. The dependent variable refers to the level of financial literacy, high or low.

The questionnaire allows the creation of measurable variables that capture some of the students' characteristics. The explanatory variables used in the study are dichotomous, categorical, and continuous. Variables like age, gender, father's education level, mother's education level, area of study in secondary school, and if students attend a course in economic and business sciences are analyzed.

Table 1 – Summary of variables used in the study.

Name of variable	Variables Code	Description of Variable
Dependent Variable		
Financial literacy level		1 = high 0 = low
Explanatory Variables		
Age	AGE	Age of the student in years
Gender	GENDER	0 = female 1 = male
The first option for the Bachelor was a course in economic and business sciences	CBS	0 = no 1 = yes
Area of study in secondary school	SSA	0 = Scientific-Humanistic Course - Socioeconomic Sciences and Professional Course in Economic and Business Sciences 1 = Scientific-Humanistic Course: Science and Technology; Languages and humanities; Visual arts 2 = Education and Training Course or Apprenticeship Course; Professional Course in other areas; Technological Course
Father's education level	FEL	0 = primary education: 1st cycle 1 = primary education: 2nd cycle 2 = primary education: 3rd cycle 3 = Secondary education 4 = Higher education
Mother's education level	MEL	0 = primary education: 1st cycle 1 = primary education: 2nd cycle 2 = primary education: 3rd cycle 3 = secondary education 4 = Higher education

Figure I shows the literacy level of the students. 159 (62.4%) have a low literacy level and 96 (38%) have a high level. This indicator was built considering the number of correct answers within the 10 questions included in the questionnaire. We considered the median as a cut-off value, which means that students with more correct answers than the median value were grouped as having

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a high level of financial literacy, while students whose number of correct answers was equal to or less than the median were grouped as having a low level of financial literacy. The median value of correct answers is 5.

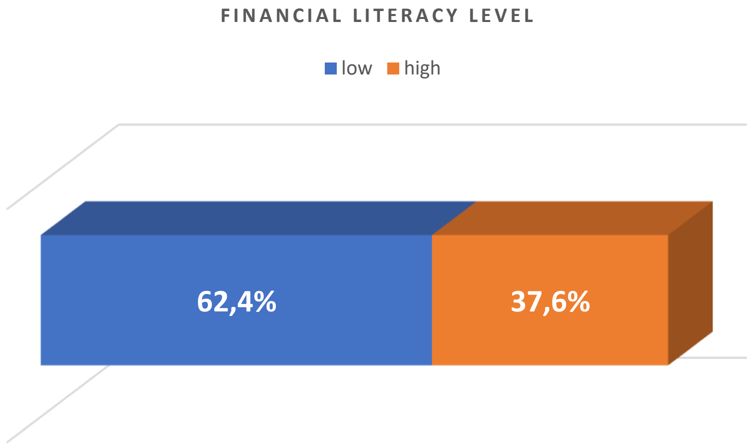

Figure 1 - Financial Literacy Level of the Students.

Table 2 shows the frequencies of the explanatory variables. As one would expect, the sample is mostly made up of young people since only 20.4% of the students are 22 or older. Regarding gender, one can see that 57.6% of the students in the sample are male, while 42.4% of them are female. More than half of the sample (57.6%) chose a business course as the first option when applying for the higher education system. However, the majority of the students (80.4%) completed a secondary course apart from socioeconomic sciences, while only 19.6% completed a course within socioeconomic sciences in secondary school. Regarding the parent's education, the mother's level is higher than the father's, as 61.5% of the students stated that their father has only basic school (compared to 48.3% when it comes to the mother's education), 30.6% stated that their father completed secondary education (compared to 36.5% when it comes to mother's education) and only 7.8% stated their father completed a course in the higher education (compared to 15.3% when it comes to mother's education).

Table 2 – Frequencies of the explanatory variables

		Frequency	%
Age (AGE)	17	22	8.6
	18	93	36.5
	19	47	18.4
	20	29	11.4
	21	12	4.7
	22+	52	20.4
Gender (GENDER)	male	147	57.6
	female	108	42.4
The first option for the bachelor's was a course in economic and business sciences (CBS)	no	147	57.6
	yes	108	42.4
Area of study in secondary school (SSA)	0	50	19.6
	1	115	45.1
	2	90	35.3
Father's education level (FEL)	0	48	18.8
	1	50	19.6
	2	59	23.1
	3	78	30.6
	4	20	7.8
Mother's education level (MEL)	0	28	11.0
	1	43	16.9
	2	52	20.4
	3	93	36.5
	4	39	15.3

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2.3 Statistical analysis

The dependent variable has two values, 0 for the students who have a low level of financial literacy and 1 for those who have a high level. Thus, the use of the multivariate logistic model makes sense in this case. The following model was contemplated to evaluate the established hypotheses:

$$P(Y=1)=\frac{1}{1+e^{-f(x)}}, \qquad (1)$$

Where $f(x) = \beta_0 + \beta_1 AGE + \beta_2 GENDER + \beta_3 CBS + \beta_4 SSA + \beta_5 FEL + \beta_6 MEL + \varepsilon$

In the logistic regression equation (1), the value of P means the probability of having a high level of financial literacy, that is, the probability that Y is equal to 1. The explanatory variables refer to the determinants, namely: AGE is the age of the students, GENDER is the gender of the student, FEL is the father's education level, MEL is the mother's education level, SSA refers to the secondary school area of studies, and CBS reports if the student attends a course in economic and business sciences.

3. RESULTS

This paper aims to analyze the influence of the determinants AGE, GENDER, FEL, MEL, SSA, and CEB on the propensity to have a high level of financial literacy. After implementing the logistic regression model for the 255 available observations, the results are shown in Table 3.

The Hosmer and Lemeshow Test shows that we cannot reject the null hypothesis that the model fits the data (χ^2=6.224; df=8; p = 0.622). Analyzing the Omnibus Test of Models Coefficients (χ^2=45.668; df=13; p < 0.001), it is possible to verify that at least one of the explanatory variables in the regression model (this is age, gender, area of study in secondary school, if students attend a course in economic and business sciences, father's education level and mother's education level) contributes to explain the level of financial literacy. So, the hypothesis that all coefficients are null is rejected. On the other hand, the results of Wald's statistics show that the explanatory variables are significant in explaining the odds of having a high literacy level, except for two (see Table 3). The education level of the mother (MEL) and secondary school area of studies (SSA) do not contribute significantly (p > .05).

Table 3 – Logistic Regression: Influence of the various determinants on the financial literacy level

	B	S.E.	Wald	df	p	OR
Age	0.069	0.024	8.656	1	0.003	1.072
Gender=Male	1.061	0.355	8.912	1	0.003	2.890
CBS=yes	0.902	0.393	5.284	1	0.022	2.466
SSA						
SSA=1 (compared to 0)	-0.499	0.533	0.877	1	0.349	0.607
SSA=2 (compared to 0)	-0.238	0.446	0.286	1	0.593	0.788
FEL						
FEL=1(compared to 0)	0.046	0.52	0.008	1	0.929	1.047
FEL=2(compared to 0)	-0.398	0.545	0.534	1	0.465	0.672
FEL=3(compared to 0)	-0.204	0.525	0.151	1	0.698	0.816
FEL=4(compared to 0)	1.908	0.760	6.304	1	0.012	6.742
MEL						
MEL=1(compared to 0)	0.133	0.642	0.043	1	0.836	1.142
MEL=2(compared to 0)	0.739	0.626	1.393	1	0.238	2.093
MEL=3(compared to 0)	-0.341	0.642	0.282	1	0.595	0.711
MEL=4(compared to 0)	-0.823	0.807	1.041	1	0.308	0.439
Constant	-3.257	0.975	11.168	1	0.000	0.038

Note: The category labels are indicated in Table 1.

As shown in Table 3, Multivariate Logistic Regression was used to estimate the odds of a student having a high financial literacy, identifying the variables independently associated with higher literacy knowledge levels. The chances of belonging to the higher literacy level category are higher for males (OR gender = 2.890, p=0.003) and increase with age (OR age = 1.072, p=0.003). Thus, the odds of having a high literacy level are 2.890 times greater when the students are males than females, keeping all other variables constant. On the other hand, the odds of having a high financial literacy level are 1.072 times greater for each additional year in age, keeping all other variables constant. The academic background of the mother does not impact the chances of having a high financial literacy and the odds increase when the father has a college degree compared to those fathers who only attended the primary school education level (OR FEL=higher education = 6.742, p=0.012). The area of study in secondary school does not significantly impact the odds (p>0.05).

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The chance of having a high literacy level is 2.466 times higher if the student chose a course in economic and business sciences as the first option for the bachelor's degree (OR CBS = 2.466, p=0.022), compared to a student who did not.

4. DISCUSSION

Regarding the positive impact of age on the level of financial literacy, the results seem reasonable since older people are more prone to having more experience related to financial issues such as loans, savings, or even investments. Thus, it makes sense that the level of financial literacy increases with age and the inherent experience within the personal finance field. This means hypothesis H1 is validated by the results we obtained. As H1 was built according to the conclusions presented by the majority of the authors included in the literature review, such as Lusardi and Mitchell (2011) and Henager and Cude (2019)Our results are aligned with them. It's particularly interesting to compare our results with the ones from Santos et al. (2022) since these authors also focused on Portugal, with the results being similar, pointing to lower levels of financial knowledge among younger people. With all of this in mind, it seems pertinent to emphasise that younger people are more likely to make bad financial decisions, as well as being the most vulnerable to fraudulent schemes such as those denounced by the Ministério Público Portugal (2021). Awareness-raising actions and more effective implementation of the topic of financial literacy in the mandatory school years could be part of the solution.

When it comes to gender, there's a significant difference between male students and female ones, as the odds of having a high level of financial literacy are 2.890 times greater when the students are male than female, keeping all other variables constant. This result validates hypothesis H2 and, therefore, is in line with the conclusions presented by the majority of the authors included in the literature review such as Lusardi and Mitchell (2008) and Blaschke (2022). It seems interesting to analyze our results considering the ones presented by Santos et al. (2022), who concluded that, in Portugal, women have a higher level of awareness regarding savings and their importance compared to men – which means that women are more aware of some issues related to personal finances, but this study shows that men have a higher level of knowledge. This could be a reinforcement for governments to implement initiatives that could reduce the gap between genders regarding financial literacy, since the most vulnerable group (women) seems to be interested in the topic.

Regarding the academic background, the courses attended in secondary school do not impact the odds of having a high level of financial literacy. Thus, hypothesis H3a is not supported. However, having chosen a business-related course as the first option when applying for higher education increases the odds of having a high level of financial literacy. This means we validate hypothesis H3b. Taking both results into account, it seems that when it comes to having a high level of financial literacy it could be a matter of interest and curiosity rather than the background regarding secondary education, because having chosen a business-related course when applying for higher education system could be seen as sign of interest in the field – and that significantly impacts financial literacy, while the course attended on secondary school does not.

The father's education level only impacts the odds of having a high level of financial literacy when we compare a college degree with a basic school education level – a father with a college degree increases the odds of having a high level of financial literacy. Thus, we partially validate hypothesis H4a. On the other hand, the mother's education level does not impact the odds of having a high level of financial literacy. This means hypothesis H4b is not correct and goes against some important works in the field, such as Lusardi et al. (2010) – maybe the fact that they studied different countries, about 15 years before, could justify the differences regarding the results. One could find these results a little surprising, because mothers are closer to their children when they are growing up (Erickson, 2014; Pakaluk & Price, 2020; Yaffe, 2023), which means mothers could have more influence on children and, therefore, young people's way of thinking and behaving. However, it could be interesting to study if our results regarding parents' education level are linked to some pattern about who deals with financial issues in families, i.e., if the father's education level impacts the odds of having a high level of financial literacy because financial questions within a family are men's responsibility in Portuguese society, or if this is not a reason for our results.

CONCLUSION

This study highlights the impact of age, gender, academic background, and parents' education on the odds of having a high level of financial literacy, considering a sample of 255 first-year college students and a logistic regression model to conduct this research. The level of financial literacy increases with age, which could be a matter of accumulated experience over time that leads to a higher level of awareness regarding financial issues, but it is something that could be tested in future research. The odds of having a high level of financial literacy are 2.890 higher among men compared to women. For future research, it seems important to understand the reasons behind this difference between genders, if it is related to cultural dimension, inherent interest in the subject, or any other cause. This way, it would be easier to combat financial illiteracy, defining adapted plans for certain targets – since, from this work, it seems important to start initiatives that focus on young women to try to reduce the discrepancy between genders.

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Regarding the choices about the academic field, having chosen a business-related course as the first option when applying for the higher education system increases the odds of having a high level of financial literacy, while the course attended in secondary school plays no significant role in it. This leads to the idea that financial literacy may depend more on the interest in the subject (deduced by having chosen a business-related course as the first option when applying for higher education) than the academic background itself. Thus, governmental entities could draw some conclusions from this, namely that the implementation of financial literacy as a lectured subject in mandatory school does not seem to need any relevant adjustment regarding the courses' field, because students are at a similar level concerning financial knowledge.

The mother's education level plays no significant role in determining the odds of having a high level of financial literacy, while a father with a college degree increases the odds of having a high level of financial literacy compared to students whose father has a basic school education level – but there's no difference in the odds of having a high level of financial literacy when comparing the other father's education level. Further research could focus on trying to replicate the study in other regions to understand whether the pattern is the same, and if it is so, it would be interesting to study why – i.e., if a person's level of financial literacy depends more on father's education level because of cultural dimensions and ways of families' self-organization (e.g., delegating to men the financial issues) or if it has nothing to do with cultural aspects and is justified by other type of variables.

This study should be seen as having some limitations, namely, the fact that the respondents are students from the Polytechnic Institutes, so a larger sample would be recommended for future research. On the other hand, our sample is composed of students, and the average age is 21 years old, which means that the results regarding gender differences should not be interpreted as an ongoing problem in every segment of society because the sample does not allow us to infer that.

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AUTHORS' CONTRIBUTION

Conceptualization, R.M., T.M., P.S. and M.R.; data curation, M.R., P.S., R.M. and T.M.; formal analysis, P.S., M.R., R.M. and T.M.; funding acquisition, P.S., M.R and R.M.; investigation, M.R., P.S., R.M. and T.M.; methodology, M.R., P.S., R.M. and T.M.; project administration, P.S., R.M., T.M. and M.R.; resources, M.R., P.S., R.M. and T.M.; software, P.S., M.R., R.M. and T.M.; supervision, R.M., P.S. and M.R.; validation, M.R., P.S., R.M. and T.M.; visualization, M.R., P.S., R.M. and T.M.; writing-original draft, M.R., P.S., T.M. and R.M.; writing- review & editing, T.M., M.R., P.S. and R.M.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.

REFERENCES

Agnew, S., & Harrison, N. (2015). Financial literacy and student attitudes to debt: A cross national study examining the influence of gender on personal finance concepts. *Journal of Retailing and Consumer Services*, *25*, 122–129. https://doi.org/10.1016/j.jretconser.2015.04.006

Alessie, R., van Rooij, M., & Lusardi, A. (2011). *Financial literacy, retirement preparation and pension expectations in the Netherlands* (NBER Working Paper No. 17109). https://doi.org/10.3386/w17109

Allianz. (2017). *When will the penny drop? Money*, *financial literacy and risk in the digital age.* (International Pension Papers 1/2017). https://encurtador.com.br/OSaI

Almeida, F., & Costa, O. (2023). Perspectives on financial literacy in undergraduate students. *Journal of Education for Business*, *98*(1), 1–8. https://doi.org/10.1080/08832323.2021.2005513

Ameer, R., & Khan, R. (2020). Financial socialization, financial literacy, and financial behavior of adults in New Zealand. *Journal of Financial Counseling and Planning*, *31*(2), 313–329. https://doi.org/10.1891/JFCP-18-00042

Antoni, X. L., Dlepu, A., & Notshe, N. (2020). A comparative study of financial literacy among undergraduate commerce and arts students: A case of a South African University. *International Journal of Economics and Finance Studies*, *12*(2), 563–580. https://doi.org/10.34109/ijefs.202012220

Bansal, D., & Kaur, L. (2023). Financial literacy and gender gap: a study of Punjab state of India. *Journal of Social and Economic Development*, 1–25. https://doi.org/10.1007/s40847-023-00253-0

DOI: https://doi.org/10.29352/mill0220e.36926

Blaschke, J. (2022). Gender differences in financial literacy among teenagers - Can confidence bridge the gap? *Cogent Economics & Finance*, *10*(1), Article 2144328. https://doi.org/10.1080/23322039.2022.2144328

Bucher-Koenen, T., & Lusardi, A. (2011). Financial literacy and retirement planning in Germany. *Journal of Pension Economics and Finance*, *10*(4), 565–584. https://doi.org/10.1017/S1474747211000485

Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2017). How financially literate are women? An overview and new insights. *Journal of Consumer Affairs*, *51*(2), 255–283. https://doi.org/10.1111/joca.12121

Chambers, R. G., Asarta, C. J., & Farley-Ripple, E. N. (2019). Gender, parental characteristics, and financial knowledge of high school students: Evidence from multicountry data. *Journal of Financial Counseling and Planning*, *30*(1), 97–109. https://doi.org/10.1891/1052-3073.30.1.97

Chen, H., & Volpe, R. P. (1998). An analysis of personal financial literacy among college students. *Financial Services Review*, *7*(2), 107–128. https://doi.org/10.1016/S1057-0810(99)80006-7

Cwynar, A. (2021). Do women behave financially worse than men? Evidence from married and cohabiting couples. *Central European Business Review*, *10*(5), 81–98. https://doi.org/10.18267/j.cebr.270

Duarte, P., Silva, S., Feitosa, W. R., & Sebastião, R. (2022). Are business students more financially literate? Evidence of differences in financial literacy amongst Portuguese college students. *Young Consumers*, *23*(1), 144–161. https://doi.org/10.1108/YC-12-2020-1264

European Central Bank. (2021). *Economic bulletin, issue 8/2021*. *8*.https://www.ecb.europa.eu/pub/pdf/ecbu/eb202108.en.pdf

Ergün, K. (2018). Financial literacy among university students: A study in eight European countries. *International Journal of Consumer Studies*, *42*(1), 2–15. https://doi.org/10.1111/IJCS.12408

Erickson, J. J. (2014). Fathers don't mother and mothers don't father: What social science research indicates about the distinctive contributions of mothers and fathers to children's development. In *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2519862

Faulkner, A. (2022). Financial literacy around the world: What we can learn from the national strategies and contexts of the top ten most financially literate nations. *The Reference Librarian*, *63*(1–2), 1–28. https://doi.org/10.1080/02763877.2021.2009955

Finke, M. S., Howe, J. S., & Huston, S. J. (2017). Old age and the decline in financial literacy. *Management Science*, *63*(1), 213–230. https://doi.org/10.1287/mnsc.2015.2293

Fonseca, R., Mullen, K. J., Zamarro, G., & Zissimopoulos, J. (2012). What explains the gender gap in financial literacy? The role of household decision making. *Journal of Consumer Affairs*, *46*(1), 90–106. https://doi.org/10.1111/j.1745-6606.2011.01221.x

Henager, R., & Cude, B. J. (2019). Financial literacy of high school graduates: Long- and short-term financial behavior by age group. *Journal of Family and Economic Issues*, *40*(3), 564–575. https://doi.org/10.1007/s10834-019-09626-2

Jacobsen, C., & Correia, J. (2019). Analysis of financial literacy in a college population. *Journal of Higher Education Theory and Practice*, *19*(4), 11–18. https://doi.org/10.33423/jhetp.v19i4.2197

Jayaraman, J. D., & Jambunathan, S. (2018). Financial literacy among high school students: Evidence from India. *Citizenship, Social and Economics Education*, *17*(3), 168–187. https://doi.org/10.1177/2047173418809712

Joo, S.-H., & Grable, J. E. (2004). An exploratory framework of the determinants of financial satisfaction. *Journal of Family and Economic Issues*, *25*(1), 25–50. https://doi.org/10.1023/B:JEEI.0000016722.37994.9f

Jorgensen, B. L., & Savla, J. (2010). Financial literacy of young adults: The Importance of parental socialization. *Family Relations*, *59*(4), 465–478. https://doi.org/10.1111/j.1741-3729.2010.00616.x

Kadoya, Y., & Khan, M. S. R. (2020). What determines financial literacy in Japan. *Journal of Pension Economics and Finance*, *19*(3), 353–371. https://doi.org/10.1017/S1474747218000379

Kubicková, D., Nulicek, V., & Jindrichovska, I. (2019). Is the financial literacy affected by the field of study? (A comparison of specialised secondary schools). *International Journal of Management Science and Business Administration*, *5*(6), 15–20. https://doi.org/10.18775/IJMSBA.1849-5664-5419.2014.56.1002

Le Fur, E., & Outreville, J.-F. (2022). Financial literacy, education and risk aversion: A survey of French students. *Managerial Finance*, *48*(9/10), 1530–1543. https://doi.org/10.1108/MF-10-2021-0509

Lind, T., Ahmed, A., Skagerlund, K., Strömbäck, C., Västfjäll, D., & Tinghög, G. (2020). Competence, confidence, and gender: The role of objective and subjective financial knowledge in household finance. *Journal of Family and Economic Issues*, *41*(4), 626–638. https://doi.org/10.1007/s10834-020-09678-9

Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: How Do women fare? *American Economic Review*, *98*(2), 413–417. https://doi.org/10.1257/aer.98.2.413

Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: An overview. *Journal of Pension Economics and Finance*, *10*(4), 497–508. https://doi.org/10.1017/S1474747211000448

DOI: https://doi.org/10.29352/mill0220e.36926

Lusardi, A., Mitchell, O. S., & Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs*, *44*(2), 358–380. https://doi.org/10.1111/J.1745-6606.2010.01173.X

Ministério Público Portugal. (2021). *Alerta cibercrime:Fraudes no mercado de criptomoedas e forex*. Procuradoria-Geral da República – Gabinete Cibercrime. http://cibercrime.ministeriopublico.pt/cibercrime@pgr.pt

Moreno-Herrero, D., Salas-Velasco, M., & Sánchez-Campillo, J. (2018). Factors that influence the level of financial literacy among young people: The role of parental engagement and students' experiences with money matters. *Children and Youth Services Review*, *95*, 334–351. https://doi.org/10.1016/J.CHILDYOUTH.2018.10.042

Nikonova, Y., Lunina, T., Prudnikov, A., & Arshba, L. (2018). The study of the level of financial literacy of students of transport universities. *MATEC Web of Conferences*, *239*, Article 07002. https://doi.org/10.1051/MATECCONF/201823907002

Okamoto, S., & Komamura, K. (2021). Age, gender, and financial literacy in Japan. *PLOS ONE*, *16*(11), Article e0259393. https://doi.org/10.1371/journal.pone.0259393

Organisation for Economic Co-operation and Development (OECD). (2015). *National strategies for financial education: OECD/INFE policy handbook*. https://encurtador.com.br/nLXT

Organisation for Economic Co-operation and Development (OECD). (2020). *OECD/INFE 2020 international survey of adult financial literacy*. https://encurtador.com.br/YfTr

Organisation for Economic Co-operation and Development (OECD). (2023). *OECD/INFE 2023 international survey of adult financial literacy*. https://doi.org/doi.org/10.1787/56003a32-en

Pakaluk, C. R., & Price, J. (2020). Are mothers and fathers interchangeable caregivers? *Marriage & Family Review*, *56*(8), 784–793. https://doi.org/10.1080/01494929.2020.1778318

Potrich, A. C. G., Vieira, K. M., Coronel, D. A., & Bender Filho, R. (2015). Financial literacy in Southern Brazil: Modeling and invariance between genders. *Journal of Behavioral and Experimental Finance*, *6*, 1–12. https://doi.org/10.1016/j.jbef.2015.03.002

Potrich, A. C. G., Vieira, K. M., & Kirch, G. (2018). How well do women do when it comes to financial literacy? Proposition of an indicator and analysis of gender differences. *Journal of Behavioral and Experimental Finance*, *17*, 28–41. https://doi.org/10.1016/j.jbef.2017.12.005

Santos, E. M. M., Tavares, V. C., Ratten, V., & Tavares, F. O. (2022). The profile of the Portuguese regarding the perception of financial literacy. *Managerial Finance*, *48*(9/10), 1301–1316. https://doi.org/10.1108/MF-05-2021-0210

Sarabando, P., Matias, R., Vasconcelos, P., & Miguel, T. (2023). Financial literacy of Portuguese undergraduate students in polytechnics: Does the area of the course influence financial literacy? *Journal of Economic Analysis*, *2*(2). https://doi.org/10.58567/jea02020007

Shim, S., Barber, B. L., Card, N. A., Xiao, J. J., & Serido, J. (2010). Financial socialization of first-year college students: The roles of parents, work, and education. *Journal of Youth and Adolescence*, *39*(12), 1457–1470. https://doi.org/10.1007/S10964-009-9432-X/FIGURES/1

Tinghög, G., Ahmed, A., Barrafrem, K., Lind, T., Skagerlund, K., & Västfjäll, D. (2021). Gender differences in financial literacy: The role of stereotype threat. *Journal of Economic Behavior & Organization*, *192*, 405–416. https://doi.org/10.1016/j.jebo.2021.10.015

Totenhagen, C. J., Casper, D. M., Faber, K. M., Bosch, L. A., Wiggs, C. B., & Borden, L. M. (2015). Youth financial literacy: A review of key considerations and promising delivery methods. *Journal of Family and Economic Issues*, *36*(2), 167–191. https://doi.org/10.1007/s10834-014-9397-0

van Rooij, M. C. J., Lusardi, A., & Alessie, R. J. M. (2011). Financial literacy and retirement planning in the Netherlands. *Journal of Economic Psychology*, *32*(4), 593–608. https://doi.org/10.1016/j.joep.2011.02.004

Wells, R. S., Seifert, T. A., Padgett, R. D., Park, S., & Umbach, P. D. (2011). Why do more women than men want to earn a four-year degree? Exploring the effects of gender, social origin, and social capital on educational expectations. *The Journal of Higher Education*, *82*(1), 1–32. https://doi.org/10.1080/00221546.2011.11779083

Yaffe, Y. (2023). Systematic review of the differences between mothers and fathers in parenting styles and practices. *Current Psychology*, *42*(19), 16011–16024. https://doi.org/10.1007/s12144-020-01014-6

Zaimovic, A., Torlakovic, A., Arnaut-Berilo, A., Zaimovic, T., Dedovic, L., & Nuhic Meskovic, M. (2023). Mapping financial literacy: A systematic literature review of determinants and recent trends. *Sustainability*, *15*(12), 1–30. https://doi.org/10.3390/su15129358