

# The changing role of education as we move from popular to highbrow culture

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(ACCEPTED VERSION)

## Abstract

Education is the socioeconomic variable that has the greatest impact on cultural participation. A higher level of education leads to greater interest and taste for culture increasing the demand of culture. But education can also indirectly affect cultural consumption because the higher the level of education, the higher the expected income and, therefore, the greater the cultural consumption. In this paper, we analyze the effect of education on cultural consumption once the impact of income is controlled for. Using information on attendance to cinema, performing arts and visits to sites of cultural interest, we analyze how the effect of education changes between these activities. To do so, we estimate a Zero Inflated Ordered Probit (ZIOP) using the 2006 and 2015 Spanish modules of the European Union Statistics on Income and Living Conditions (EU-SILC). We find that the effect of education varies between activities, being its marginal effect more relevant for highbrow activities than for popular culture. On the contrary, given a certain level of education, an increase in income will bring more people to the cinema than to theaters or museums. This result is consistent with the idea that highbrow cultural consumption involves the comprehension of more complex symbolic elements, and individuals' decoding abilities depend more on education than on income.

Key words: cultural participation, education, cinema, performing arts, museums  
JEL: Z11

This paper has been published as: Suarez-Fernandez, S., Prieto-Rodriguez, J., & Perez-Villadoniga, M. J. (2020). The changing role of education as we move from popular to highbrow culture. *Journal of Cultural Economics*, 44(2), 189-212. doi: 10.1007/s10824-019-09355-2

## 1. INTRODUCTION

Traditionally, one of the main justifications for public policies in favor of cultural participation is based on Musgrave's (1959) definition of *merit goods*, as cultural goods could be considered as such. Furthermore, since Baumol and Bowen (1966), economists have been concerned about the characteristics of cultural consumers. The adequate knowledge of the determinants of the likelihood and the intensity of cultural participation is of great interest not only for public agencies and governments, but for art managers and cultural industries too. For the first ones, the public sector, it is essential to identify the profile of both attendees and non-attendees since cultural policies generally involve subsidies and tax benefits and it is important to determine who could benefit the most. For the private sector, a better understanding of the consumer profiles is needed to successfully develop their products and publicity campaigns to attract new consumers and to maintain the actual ones.

According to previous studies, education -including specific artistic training as in Kracman (1996)- is the socioeconomic variable with the highest forecasting accuracy on cultural demand (see for instance, Ateca-Amestoy and Prieto-Rodríguez, 2013). This is due to two effects. First, a direct effect, given that the higher the level of education the greater their cultural capital and, thus, the greater their interest in culture. From the economic theory point of view, this interest in culture could be an argument of the underlying utility function but not a determinant of its functional form, as in Becker and Murphy (1988). In any case, utility will depend both on current cultural consumption and cultural capital, and the higher the cultural capital the higher the demand for culture.<sup>1</sup> Second, an indirect effect, through people's purchasing power, since more education usually means higher income and, therefore, higher consumption of any luxury good, such as culture. This point was already raised by Seaman (2005 and 2006) and it is central to this paper where the role of education as determinant of cultural demand is analyzed.

Cultural capital may have a different importance depending on the type of cultural good. On the one hand, decoding symbolic elements, associated to highbrow culture, usually requires a certain endowment of cultural capital. On the other hand, popular culture can be enjoyed

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<sup>1</sup> From a sociological perspective, according to Bourdieu (1986), education contributes both to the embodied state and the institutionalized state of cultural capital. However, "it should be noted that the term 'cultural capital' is used in other disciplines to mean something different from its interpretation in economics. In sociology, the term is used, following Pierre Bourdieu, to mean an individual's competence in high status culture. In economic terms, this characteristic of people can be construed as an aspect of their human capital." (Throsby, 2003).

more easily regardless of individuals' cultural capital. As a result, the relative importance of education may vary across cultural activities. We expect a higher impact as we move towards more intellectually demanding forms of culture.

To check whether this effect of education actually changes according to the cultural activity, it would be convenient to have the same referential framework, e.g., analyzing the consumption of different types of cultural goods by the same individual. In this paper, we take advantage of the data on individuals' declared consumption of three different cultural goods provided by the 2006 and 2015 modules of the European Union Statistics on Income and Living Conditions (EU-SILC) in Spain. Therefore, we analyze separately the probabilities of going to the cinema, attending live performances (concerts, opera, theatre, ballet, dance) and visiting sites of cultural interest (monuments, museums, archaeological sites and galleries) and we evaluate the marginal effects of education for each of these activities. By estimating Zero Inflated Ordered Probit models (ZIOP), we distinguish between attendants and non-attendants and, within this latter group, those who, although did not attend in the reference period, have nevertheless a significant probability of attending and those with a negligible likelihood of participation.

The article is structured as follows. Section 2 reviews the related literature. In Section 3 we describe the database used and Section 4 explains the empirical model estimated. The main results of the article are developed in Section 5. Lastly, Section 6 concludes.

## **2. EDUCATION AS DETERMINANT OF CULTURAL PARTICIPATION**

There are mainly two models focused on experiences and tastes which are particularly relevant when explaining cultural consumption. Following Becker and Murphy (1988) in their "rational addiction" model, music consumption, as any other cultural good, may generate *addiction*. That is, there is an effect of past consumption on current utility, since the more culture the individual consumes, the more value she places on it. Alternatively, in "learning-by-consuming" models (Levy-Garboua and Montmarquette, 1996), individuals *learn* how to appreciate cultural goods as they consume them. The authors find that, for theatre plays, each time the consumer watches a play, she upgrades her expectations of her own *taste* for it. Considering both models, education plays an important role in explaining cultural demand.

Using the analogy of the production function, education could be understood as a determinant of the “underlying technology” of the process by which cultural consumption is transformed into utility. For instance, the contemplation of an artwork will change the observers’ utility in a different way depending on their own education level. Those with higher education will probably be able to extract more utility and, thus, will have higher demand.<sup>2</sup>

Furthermore, education would also determine initial cultural capital and its depreciation rate. In other words, education level accounts for people’s human capital, which, following Becker and Murphy (1988), influence people’s ability to transform initial cultural capital and past cultural consumption into current cultural capital. For Levy-Garboua and Montmarquette (1996), it could alter the individual’s preferences. As result, higher levels of education are associated with greater cultural demand, as they positively correlate with the stock of cultural capital and taste for culture (see, for example, Andreasen and Belk (1980), Borgonovi (2004), D’Angelo *et al.* (2010), Falk and Katz-Gerro, 2016; Ateca-Amestoy and Prieto-Rodriguez (2013), Willekens and Lievens, (2014, 2016)).

Moreover, consuming culture involves interiorizing and assimilating the symbolic elements that cultural goods incorporate. These elements become more complex as we move from popular to highbrow culture. Hence, we expect that more educated people were more likely to be able to decode more complex symbolic elements and, consequently, appreciate (highbrow) cultural goods. Therefore, the link between education and cultural demand should be stronger for highbrow activities. This argument is related to the so-called in sociology *cognitive hypothesis* that states that “cultural participation depends on a person’s cognitive abilities, which is why educational stratification in cultural consumption is so evident, especially among consumers of high culture” (Notten et al., 2015).

As stated in the Introduction, education is positively correlated with income and earnings. Earnings, in turn, are associated with cultural consumption given that they determine the economic constraints faced by individuals when maximizing their utility, as in Becker and Murphy (1988). Individual earnings have proved to be relevant in many empirical papers such as Moore (1966), O’Hagan (1996), Cuadrado and Frassetto (1999), Borgonovi (2004) or Sisto and Zanola (2010). Income, as a determinant of the demand for culture, comprises two

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<sup>2</sup> Since its publication, Becker’s (1965) approach of household production has been applied to model many decisions within the household.

opposite effects (Throsby, 1994; and Zieba, 2009). On the one hand, greater income is expected to increase the demand for cultural goods, provided that those are normal goods or, as usually happens regarding cultural consumptions, luxury goods (Prieto-Rodriguez et al., 2005). On the other hand, it entails higher opportunity cost of leisure and lower time availability for cultural participation. In order to take into account this opportunity cost, it is usual in the literature to introduce in the empirical specification controls that account for labor status (as in Garcia-Enriquez and Echevarria, 2018, or Lazzaro and Frateschi, 2017).

Given that income and education are very strong markers of social class and their combination is a powerful predictor of (highbrow) cultural consumption, from the seminal paper by Baumol and Bowen (1966), cultural participation has been recurrently described as *elitist* by many empirical papers. Yet, this label should not fool us. Education, not social class, is the main variable to explain cultural participation, especially for highbrow culture. As Reeves (2015) states “arts participation [...] is not primarily explained through social status or social class but rather through education.” Therefore, we will focus on the effect of education, once household income is controlled for, and check its importance relative to the income impact.<sup>3</sup>

### **3. DATA AND METHODOLOGY**

#### **3.1 Database**

The empirical analysis of this paper is based on the data from the European Union Statistics on Income and Living Conditions (EU-SILC) for Spain.<sup>4</sup> It is a harmonized survey aimed at collecting comparable data on income, poverty, social exclusion and living conditions. In Spain it is conducted by the National Institute of Statistics. Data are collected yearly through face-to-face interviews considering both individual and household levels. It is a survey representative of the Spanish population and it gathers data on socio-demographic features such as gender, age, education level, labor status, income or health conditions. In addition, each year the EU-SILC incorporates a module with supplementary variables on a specific

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<sup>3</sup> For a general survey on other determinants of cultural participation see, for instance, Seaman (2006).

<sup>4</sup> Some issues about the comparability between data from international EU-SILC are raised by O'Hagan, 2017.

topic.<sup>5</sup> The 2006 and 2015 modules refer to social participation during the previous year, including three cultural activities: attendance to the cinema, performing arts (theatre, concerts, the opera, ballet or dance) and visiting cultural sites (historical monuments, museums, art galleries or archaeological sites). Data do not allow us to go deeper in the classification of cultural activities, therefore, in what follows, we are considering cinema as part of popular culture, although some forms of cinema, such as independent cinema, could be not. Similarly, certain expressions under the label of performing arts in the surveys, e. g., pop and rock concerts, can be popular culture but are treated as (relatively) highbrow activities.

The EU-SILC 2006 was used by Falk and Katz-Gerro (2016) for an international comparative of the determinants of visiting sites of cultural interest. A possible limitation of these data is that answers are limited to quantitative categories and, additionally, they are not defined in the same way in both years. Both waves were homogenized to the three categories established in the 2015 wave: zero attendance, between one and three times and more than three times in the previous 12 months.<sup>6</sup> Our final sample is composed of 28,144 and 26,837 individuals in 2006 and 2015, respectively. A summary of the number of respondents belonging to each category for the three activities is provided in Table 1.

**Table 1. Dependent variable values**

<b>Attendance frequency</b>	<b>Cinema</b>	<b>Perf. arts</b>	<b>Cult. sites</b>
<b>2006</b>			
Zero	15,373 (54.6%)	18,606 (66.1%)	16,414 (58.3%)
Between 1 and 3 times	5,555 (19.7%)	5,904 (21.0%)	6,773 (24.1%)
More than 3 times	7,216 (25.6%)	3,634 (12.9%)	4,957 (17.6%)
<b>Total</b>	<b>28,144</b>	<b>28,144</b>	<b>28,144</b>
<b>2015</b>			
Zero	14,956 (55.7%)	17,989 (67.0%)	17,678 (65.9%)
Between 1 and 3 times	6,572 (24.5%)	5,342 (19.9%)	5,021 (18.7%)
More than 3 times	5,309 (19.8%)	3,506 (13.1%)	4,138 (15.4%)
<b>Total</b>	<b>26,837</b>	<b>26,837</b>	<b>26,837</b>

Note: row percentages in brackets

According to Table 1, more than half of the sample declares not having attended to the cinema, whereas for performing arts and visits to sites of cultural interest this proportion rises

<sup>5</sup> Compared to other surveys, the EU-SILC is the most suitable for our purpose as it contains information on both education and income (Ateca-Amestoy and Villarroya, 2017).

<sup>6</sup> In the 2006 wave, the original information regarding attendance is more disaggregated, defining 5 levels of attendance: None, 1-3 times, 4-6 times, 7-12 times and more than 12 times. We pool the last three groups in order to be consistent with the 2015 classification.

up to nearly two-thirds. This high proportion of non-attendees to each activity can be interpreted as a signal of the presence of a zero inflation problem. The main descriptive statistics for the whole sample, composed of individuals over 17 years of age, are presented in Table 2.

**Table 2. Descriptive statistics**

	2006		2015	
	Mean	SD	Mean	SD
Male	0.477	-	0.476	-
Age	47.832	18.25	50.774	18.62
Secondary	0.420	-	0.471	-
Tertiary	0.200	-	0.261	-
Weighted income	14.041	9.01	18.030	11.84
Single	0.293	-	0.302	-
Married	0.590	-	0.559	-
Household size	3.284	1.34	3.047	1.29
Very good health	0.163	-	0.151	-
Good health	0.499	-	0.557	-
Regular health	0.210	-	0.210	-
Part-time	0.051	-	0.063	-
Full-time	0.425	-	0.365	-
Student	0.074	-	0.078	-
Unemployed	0.164	-	0.145	-
Very populated	0.457	-	0.491	-
Regularly populated	0.214	-	0.213	-

In order to capture the economies of scale in consumption within households, weighed income is defined, in thousands of euros, as the total household income divided by the square root of household members.

### 3.2 Empirical model

In order to explain cultural demand, we use a Zero Inflated Ordered Probit (ZIOP) model (Harris and Zhao, 2007). The ZIOP model is an extension of the basic ordered probit model to accommodate ordered dependent variables characterized by excessive zero observations. In the case of cultural participation, individuals can be classified into (potential) participants (attending a positive number of times or, eventually, zero) and non-participants. Consequently, sample zeros could be either people who wouldn't attend in any case (non-participants), or individuals who may have not attended, but could decide to do so under

different circumstances (potential participants). Therefore, the two types of zeros are determined by different behaviors, so they cannot be assumed to come from the same data generation process. Additionally, for potential participants and attendants, ZIOP models allow analyzing differences in the frequency of attendance when it is measured as an ordered variable.<sup>7</sup>

Following the standard literature (see Seaman, 2006), we explain demand in the three selected cultural activities (cinema, performing arts and visits to sites of cultural interest) as a function of consumer's sociodemographic characteristics, paying special attention to education level and income. Formally, we jointly estimate the following two equations of the ZIOP model to explain both the probability of participation and the intensity of attendance (conditional on being a participant):

$$Prob\ of\ Participation_{ij} = f(Soc_{ij}, Edu_{ij}, Income_{ij}, Lab_{ij}, Health_{ij}, Geo_{ij}) \quad (1)$$

$$Intensity\ of\ Attendance_{ij} = f(Soc_{ij}, Edu_{ij}, Income_{ij}, Lab_{ij}, Health_{ij}, Geo_{ij}) \quad (2)$$

where the dependent variable *Prob of Participation<sub>ij</sub>* is a non-observable dummy variable, that will be endogenously defined by the model, classifying individuals either as (potential) participants or non-participants; and *Intensity of Attendance<sub>ij</sub>* is an ordinal variable which takes value zero when the individual *i* declares not having attended to the activity *j* but is considered as a potential participant by the model, value 1 when the individual has attended between one and three times, and value 2 when she has attended more than three times.

The probability of participation, as modelled by Equation (1), will split the sample into two groups that might be so different that will be associated to two different data generation processes. For (potential) participants, the intensity in their demands will be modelled by Equation (2). Therefore, it could be hypothesized that some of the explanatory variables may differentially affect both parts of this decision process. For instance, as suggested by Fernandez et al. (2009) “[class] probabilities rely on variables related to preferences (age, gender, education, movie valuations, etc.) whereas the behavioural functions depend on variables likely to be related to economic restrictions (i.e. the budget line and the opportunity

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<sup>7</sup> If available data on attendance were a count variable, the appropriate model would be a Zero Inflated Negative Binomial (ZINB) model (see Ateca-Amestoy, 2008). Examples of ZIOP models used to analyze cultural consumption include Downward *et al.* (2011) for modelling sports participation and Borowiecki and Prieto (2015) for video games playing.



cost of time) faced by the consumers within this given theoretical structure, the model is indeed identified.” The underlying assumption derived from this paper is, hence, that variables related to taste will have a stronger influence on the probabilities of non-attendance and variables related to economic restrictions will have a stronger influence on the frequency of attendance conditional on being a participant.<sup>8</sup> However, instead of setting *a priori* which variables determine each decision, we have preferred to include the same set of explanatory variables in both equations and check, from the significance of the estimated coefficients, whether this hypothesis is correct.

Below we discuss the expected overall effect of the covariates that we have included in the empirical specification. First,  $Soc_{ij}$  is a vector of socio-demographic variables including gender, age, marital status and household size. Cultural demand presents a large gender effect since women are more likely than men to participate, especially in high-brow cultural activities (Christin, 2012; Gray, 2003; Muñiz *et al.*, 2014). A possible explanation given in sociology for this gender gap relates to “gender-specific socialization patterns in the family” (Willekens and Lievens, 2016) whereby women may find the development of cultural capital more valuable than economic capital. Moreover, females may find their cultural capital more valued in the labor market, as professional occupations related to the arts and humanities tend to be more feminized.<sup>9</sup> Age is explanatory of the demand of culture, although its effect depends on the particular activity (Colbert *et al.*, 1998; Gray, 1998; Borgonovi, 2004) in line with learning-by-consuming processes (McCain, 1979; 1995) and rational addiction theory (Becker and Murphy, 1988). Additionally, individuals’ leisure time is affected by marital status. Having a partner could affect leisure preferences favoring the coordination between each one’s hobbies, changing the probability of participation and its intensity. Besides, it might allow for more leisure time if, for example, once the presence of children is controlled, they could share housework and, thus, increase their leisure time and their frequency of attendance. Therefore, we include dummies indicating whether the individual is *single* or *married*, being other situations (separated, divorced or widower) the reference group.

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<sup>8</sup> From a more sociological point of view, Yaish and Katz-Gerro (2012) discuss the different role of tastes and restrictions in shaping cultural participation suggesting that “participation is constrained to a larger degree by financial resources than by tastes and to a lesser degree by cultural resources [...] tastes are shaped to a greater degree than participation by socialization processes and through the habitus and, to a lesser degree, by financial resources.”

<sup>9</sup> According to Figueiredo *et al.* (2015), on average for Portugal, Spain and Italy, only 8.3 percent of males are employed at Education, Humanities & Arts while 23.2 percent of females work in these occupations.

Second,  $Edu_{ij}$  comprises two dummy variables, *secondary* and *tertiary* education, leaving *primary* education as the reference category. Since these variables capture academic credentials, they would be mainly part of the institutionalized state of the cultural capital, as conceptualized by Bourdieu (1986). This, in turn, affects (future) cultural consumption.

Third,  $Income_{ij}$  are the earnings allocated to each household member. Even when individual income is available, it may be better to use household's income so as to take into consideration that economic opportunities are weighted in relation to the number of household members, using the criteria proposed by the Organisation for Economic Co-operation and Development (OECD).

Fourth,  $Lab_{ij}$  includes dummies for labor status: *part-time*, *full-time*, *unemployed* and *student*, being *retired* and *other possible situations* the reference category. The individual's occupational situation is an indicator of the working time and, thus, the remaining time for leisure. Its effect could be twofold, as being employed affects income positively thus leading to greater demand but, conversely, tends to reduce free time availability. Since labour status is related to time availability and income constraints, we would expect it to have a larger impact on the intensity of attendance.

Fifth,  $Health_{ij}$  accounts for people's declared health status, including *very good health*, *good health*, and *fair health* situations, being *poor* and *very poor health* conditions the reference category. Health condition is another core determinant, which is often neglected, of cultural demand. Given that attendance to the cinema and performing arts, and visits to sites of cultural interest are performed outside the house and require good mobility, health situation plays an important role in determining cultural engagement, as noted previously in the literature (Samdahl and Jekubovich, 1997; Scherger, 2009; or Hallmann *et al.*, 2017).

Lastly,  $Geo_{ij}$  stands for geographical control variables that classify individuals' place of residence. It includes controls for population size (*highly populated*, *moderately populated* and *sparsely populated*) and a set of regional dummies to account for unobserved geographic differences. As noted by Cuadrado and Frassetto (1999) or Gray (2003), cultural participation is mostly an urban phenomenon. Due to the supply diversity linked to the size of regions and cities, regional controls are also needed.

## 4. RESULTS

In this section, we first discuss the determinants of the probability of participating in each of the three activities, the inflation equation of the ZIOP. Then, we present the impact of the explanatory variables on the frequency of attendance, the ordered probit equation.

**Table 3. Zero-inflated ordered probit estimation 2006**

	2006						2015					
	Cinema		Performing arts		Cultural sites		Cinema		Performing arts		Cultural sites	
	(1a) Particip.	(2a) Intensity	(3a) Particip.	(4a) Intensity	(5a) Particip.	(6a) Intensity	(1b) Particip.	(2b) Intensity	(3b) Particip.	(4b) Intensity	(5b) Particip.	(6b) Intensity
Male	-0.30*** [-4.74]	-0.04 [-1.48]	-0.33*** [-2.72]	-0.09 [-1.18]	-0.12*** [-6.66]	-0.02 [-0.87]	-0.24*** [-5.46]	-0.04 [-1.61]	-0.38*** [-5.87]	-0.10*** [-2.76]	-0.09*** [-5.25]	-0.02 [-0.63]
Age	-0.09*** [-4.87]	0.01 [0.73]	-0.02 [-1.09]	-5e-04 [-0.03]	0.05*** [11.13]	0.03*** [4.54]	-0.02** [-2.39]	-0.04*** [-5.77]	0.03** [1.98]	-0.04*** [-5.05]	0.04*** [9.89]	0.02*** [3.07]
Age square	3e-04** [2.13]	-9e-05 [-0.89]	-1.6e-04 [-0.93]	1.2e-04 [0.77]	-4e-04*** [-11.99]	-2e-04*** [-3.27]	-3e-04*** [-3.20]	4e-04*** [6.20]	-7e-04*** [-4.83]	4e-04*** [6.26]	-4e-04*** [-11.24]	-2e-04** [-2.24]
Secondary	0.46*** [6.93]	0.35*** [8.16]	0.44*** [3.67]	0.32*** [4.32]	0.47*** [21.41]	0.34*** [8.95]	0.31*** [4.70]	0.43*** [7.52]	0.50*** [5.13]	0.24*** [4.00]	0.41*** [15.17]	0.21*** [3.94]
Tertiary	0.91*** [10.22]	0.60 [12.19]	0.93*** [6.21]	0.59*** [6.29]	0.91*** [33.43]	0.65*** [15.78]	0.67*** [9.22]	0.66*** [11.04]	0.76*** [6.84]	0.64*** [8.89]	0.92*** [29.83]	0.50*** [9.03]
W. income	0.02*** [3.49]	0.03*** [10.44]	0.01** [2.06]	0.03*** [11.34]	0.03*** [22.54]	0.02*** [8.89]	0.03*** [7.88]	0.03*** [13.34]	0.01* [1.65]	0.03*** [15.72]	0.04*** [24.46]	0.01*** [5.06]
W. income sq.	-1e-04*** [-5.02]	-1e-04*** [-7.27]	-1e-04*** [-2.74]	-1e-04*** [-6.02]	-1e-04*** [-10.34]	-6e-05*** [-3.86]	-2e-04*** [-5.89]	-2e-04*** [-7.31]	-7e-05 [-1.54]	-2e-04*** [-9.33]	-2e-04*** [-12.41]	-3e-05 [-1.32]
Single	-0.62*** [-5.21]	0.44*** [6.29]	-0.53*** [-3.61]	0.37*** [3.03]	0.05 [1.32]	0.09 [1.57]	-0.38*** [-4.26]	0.24*** [3.97]	-0.44*** [-3.15]	0.17*** [2.72]	0.06 [1.53]	0.07 [1.22]
Married	0.13 [1.45]	-0.23*** [-3.86]	0.26*** [2.68]	-0.10* [-1.66]	0.15*** [5.15]	-0.05 [-1.09]	0.03 [0.52]	-0.14*** [-2.77]	0.09 [0.96]	-0.04 [-0.91]	0.15*** [5.11]	-0.07 [-1.42]
Household size	-0.14*** [-5.41]	-0.02* [-1.84]	-0.15*** [-4.10]	-0.02 [-1.34]	-0.10*** [-14.38]	-0.07*** [-5.98]	-0.10*** [-4.78]	-0.01 [-0.96]	-0.16*** [-5.32]	-0.06*** [-4.44]	-0.13*** [-15.63]	-0.05*** [-3.98]
Very good health	0.67*** [5.46]	0.18* [1.87]	0.57* [1.92]	0.29*** [3.30]	0.62*** [17.00]	0.22*** [3.51]	0.76*** [6.43]	0.49*** [4.60]	1.09*** [5.77]	0.21** [2.26]	0.70*** [15.24]	0.23*** [2.62]
Good health	0.66*** [6.74]	0.08 [0.85]	0.59*** [5.30]	0.17* [1.88]	0.44*** [14.30]	0.16*** [2.82]	0.59*** [5.99]	0.40*** [3.94]	0.72*** [5.92]	0.21** [2.38]	0.51*** [12.47]	0.15* [1.89]
Fair health	0.40*** [4.01]	0.02 [0.22]	0.33*** [2.92]	0.12 [1.26]	0.35*** [10.98]	0.11* [1.85]	0.31*** [3.10]	0.22** [2.13]	0.37*** [3.21]	0.05 [0.59]	0.29*** [6.75]	0.03 [0.36]
Part-time	-0.01 [-0.06]	0.10* [1.75]	-0.04 [-0.14]	0.04 [0.58]	-0.06 [-1.42]	0.06 [0.97]	-0.08 [-0.70]	0.25*** [3.81]	0.16 [0.44]	0.11* [1.68]	-0.07 [-1.64]	-0.06 [-0.88]
Full-time	0.09 [1.05]	0.17*** [3.98]	-0.15 [-0.51]	0.09 [1.19]	0.02 [0.63]	-0.04 [-0.98]	0.03 [0.36]	0.21*** [3.95]	-0.29** [-2.07]	0.19*** [3.87]	-0.07** [-2.31]	-0.03 [-0.70]
Student	0.14 [0.61]	0.65*** [10.26]	0.37 [0.54]	0.52*** [7.09]	0.77*** [17.74]	0.38*** [6.45]	0.15 [0.92]	0.45*** [6.47]	-0.51 [-1.25]	0.55*** [6.72]	0.55*** [10.85]	0.26*** [3.31]
Unemployed	0.30*** [2.79]	-0.18** [-2.05]	0.22* [1.93]	-0.03 [-0.45]	0.09*** [2.58]	-0.02 [-0.29]	-0.36*** [-3.83]	0.04 [0.72]	-0.43** [-2.33]	-0.04 [-0.58]	-0.30*** [-8.34]	-0.07 [-1.08]
Very populated	0.30*** [3.97]	0.30*** [7.98]	0.13 [0.87]	0.06 [1.11]	0.24*** [10.95]	0.22*** [6.49]	0.36*** [6.34]	0.17*** [4.92]	-0.01 [-0.08]	0.14*** [4.16]	0.25*** [11.09]	0.15*** [3.99]
Regularly pop.	0.09 [1.16]	0.24*** [5.88]	0.09 [0.71]	-0.01 [-0.24]	0.16*** [6.68]	0.10*** [2.62]	0.18*** [2.90]	0.26*** [6.51]	-0.02 [-0.17]	0.18*** [4.29]	0.12*** [4.53]	0.14*** [3.22]
Constant	3.61*** [4.41]		1.33 [0.71]		-3.23*** [-21.91]		0.74* [1.65]		0.48 [0.56]		-2.86*** [-20.75]	
cut1	0.87*** [2.83]		1.46*** [3.07]		-3.82*** [-5.64]		0.18 [0.69]		0.53** [1.98]		-4.54 [-0.05]	
cut2	1.78*** [5.84]		2.41*** [5.49]		2.04*** [8.43]		1.35*** [5.46]		1.45*** [5.71]		1.29*** [5.42]	
Observations	28057		28057		28057		26837		26837		26837	
Number of zeros	15317		18545		16355		14956		17989		17678	
chi2	1746.70		1039.15		982.891		1460.86		1534.20		756.714	
Log likelihood	-21333.2		-21166.9		-23217.9		-20891.2		-19890.5		-19881.6	
BIC	43434.5		43102.0		47204.0		42547.1		40545.8		40527.9	

Notes: z-score in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All models include controls for region of residence.

#### 4.1 Participation decision

Table 3 displays the determinants of the probability of ever attending to the cinema (columns 1a, 1b), performing arts (3a, 3b) or visiting cultural sites (5a, 5b), respectively, in 2006 (a) and 2015 (b). A negative sign is interpreted as reducing the probability of participation (i.e. increasing the likelihood of being an absolute zero). In general, the results are as expected and they are stable over the period considered.

Regarding gender, females are significantly more likely to participate in any of the three activities considered, especially in performing arts. This result is consistent with previous findings in the literature; for instance, Sisto and Zanola (2010), for cinema attendance; Gray (1998) for museums attendance or Colbert *et al.* (1998) for theatre attendance. We find an increasing probability of attending performing arts and visiting sites of cultural interest as people get older although the effect is concave, decreasing after age 40. Regarding cinema, we find a significant negative effect of age, as in Fernandez-Blanco *et al.* (2009).

In line with our previous discussion, higher education levels are associated with a greater probability of participating in the three cultural activities, and the magnitude of the effect increases with the education level achieved. Besides, the effect of income is positive and significant in the three cases. Therefore, conditional on education (and other characteristics), individuals with higher income are more likely to participate in cultural activities, although at a diminishing rate.

Compared to their separated, divorced or widowed peers, singles are less likely to go to the cinema, whereas married people are more prone to visit sites of cultural interest, in line with the effect found by Willekens and Lievens (2016).

In the case of individuals who are currently working, time constraints do not seem to affect their likelihood of ever participating in any of the activities considered. Students have more chances of visiting sites of cultural interest, while those who are unemployed in 2015 show far lower probabilities of being participants in any of the three activities. This last result is consistent with Kunze and Suppa's (2017) findings but the effect is not so clear in our 2006 sample.

In line with the findings of Samdahl and Jekubovich (1997), Scherger (2009) and Hallmann et al. (2017), individuals with better health conditions are more likely to participate in the cultural activities analyzed. Perhaps, as they are all performed outside of the home, those suffering from health illness have lower chances to enjoy either of the three cultural activities.

Similar to the effects found in van Eijck and Knulst (2005); Borgonovi (2004) or Purhonen *et al.* (2011), people who live in highly or medium populated areas exhibit more chances of going to the cinema or performing arts and visiting museums. The explanation is straightforward, as larger cities have a wider supply of cultural products, both in terms of the number of cinemas and the types of films they offer. Bigger cities also gather more monuments and museums, which explains why people living in those cities are more likely to visit sites of cultural interest. However, this variable is not statistically significant to explain performing arts' attendance.

## **4.2 Intensity of attendance**

In columns (2a, 2b), (4a, 4b) and (6a, 6b) of Table 3 we present the determinants of the frequency of attendance for the ordered probit equation. Again, results are relatively stable over time.

In the case of performing arts, women that participate do it more habitually than men, as found repeatedly in the literature (Ateca-Amestoy, 2008; or Purhonen *et al.*, 2011 among others). For the other two activities, we only find a significant gender effect for the participation decision but not for the intensity conditional on being a participant.

Young people tend to go more often to the cinema and performing arts, as in Gray (1998), or Yamamura (2009). Accordingly, we find a recovery in the level of attendance for participants in these two activities aged 40 or more years.

Individuals with higher educational achievements are not only more likely to be participants, but also attend more frequently to the cinema, performing arts and cultural sites (see for instance Ateca-Amestoy, 2008; Borowiecki and Marvao, 2017; van Eijck and Knulst, 2005; or Wen and Cheng, 2013).

Similarly, income has a positive and concave effect on the intensity of cultural participation in the three cultural activities, consistent with culture being a normal (or luxury) good (see Sisto and Zanola, 2010). The estimated coefficients for the intensity equation are larger relative to those estimated for the participation equation for cinema and performing arts. This would be the expected result if income acted mainly as a financial barrier. The fact that, in the case of visits to cultural sites, especially for the 2015 wave, the income effect is lower for the intensity of the attendance rather than the participation equation may indicate that income is as well related to preferences or social class position (Willekens and Lievens, 2014).<sup>10</sup>

While single individuals are more likely to be never-attenders, those who actually participate tend to go more often to the three cultural activities. On the other hand, those who are married tend attend to the cinema less frequently. Regarding labor status, working individuals have a higher attendance rate to the cinema, and those working full-time also go more often to the performing arts. Among all groups, similarly to Gray (1998), Cuadrado and Frasquet (1999), students are the group showing higher regularity in the participation to any of the three cultural activities.

In line with the results of the participation equations, healthier individuals exhibit higher rates of attendance to cultural activities. Living in highly or medium populated places encourages both participation and intensity to the three cultural activities when compared with those living in scarcely populated cities (Weng and Cheng, 2013).

### **4.3 The changing role of individuals' cultural capital as we move from popular to highbrow culture**

In this section we provide a more thorough analysis of the role of education on cultural participation. Formal education can be regarded as part of the generic cultural capital of people. We expect that the importance of cultural capital (approximated through education) will grow as the symbolic elements incorporated by cultural goods become more complex, that is, highbrow activities.

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<sup>10</sup> We would like to thank an anonymous referee for pointing us in this direction.

As we already mentioned, apart from attendees, our empirical model allows distinguishing two types of non-attendees, classifying them as absolute zeros –those who do not participate and are not expected to do so- and recoverable zeros -whose cultural participation has been zero but could have participated. Table 4 displays the average forecasted probabilities associated to each activity by educational level. These probabilities were evaluated at the mean values of the covariates, i. e., the probability of each participation status of the average person were she assigned different levels of education.

**Table 4. Probabilities of attendance by education level**

	No participant			Participant								
	Absolute zero			Recoverable zero			Low demand			High demand		
	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed	Prim Ed.	Sec Ed	Ter Ed
<b>2006</b>												
<b>Cinema</b>	37.49	21.78	10.90	30.25	27.22	23.11	20.26	27.42	30.77	12.00	23.58	35.22
<b>Performing arts</b>	34.37	19.90	9.14	42.32	41.73	37.58	17.21	25.73	32.22	6.10	12.63	21.06
<b>Cultural sites</b>	73.63	56.52	39.14	2.7E-06	6.7E-07	1.5E-07	19.70	27.31	30.73	6.67	16.17	30.13
<b>2015</b>												
<b>Cinema</b>	45.07	33.21	21.25	25.71	20.47	18.00	21.68	29.47	34.47	7.53	16.85	26.27
<b>Performing arts</b>	37.35	20.65	14.03	41.82	45.68	35.96	15.34	23.13	29.64	5.49	10.54	20.38
<b>Cultural sites</b>	82.71	70.22	50.93	1.2E-06	6.7E-07	2.0E-07	12.37	19.07	25.83	4.92	10.71	23.25

Regardless of the educational level, considering low and high demands jointly, cinema presents the highest probabilities of attendance, thus it is the most popular cultural activity although less so in 2015, mostly due to an important drop in the high demand probability.<sup>11</sup> On the other hand, looking at the probabilities of being an absolute zero, visits to cultural sites are the least popular activity. Moreover, almost all those who decide not to visit cultural sites are not recoverable, i. e., would not attend in any case. In contrast, performing arts exhibit the largest proportion of non-attendants that could be attracted to participate (recoverable zeros). Regarding differences in attendance by education, we find that more educated individuals show a much lower probability of being an *absolute zero* for the three cultural activities, being this effect more pronounced in 2006.

To have an insight on the representativeness of the results above, in Table 5 we display correlations between education and the different probabilities of attendance to each activity. A correlation coefficient close to one implies that differences in the probability of attendance

<sup>11</sup> This could be related to the appearance and development of close substitutes such as Netflix, HBO or Amazon Prime Video to the traditional consumption of cinema at movie theatres.

within educational groups will tend to zero, while individuals with different educational attainments will exhibit different probabilities.

First, for the three activities, we find a positive and strong correlation between education and the predicted probabilities of having either low or high demand. This correlation is weaker for cinema attendance than for highbrow activities. Additionally, this correlation is especially strong for the probability of low demand of performing arts and the probability of high demand for visits of cultural sites.

**Table 5. Correlations between education and probabilities of attendance**

	Absolute zero	Recoverable zero	Low demand	High demand
<b>2006</b>				
<b>Cinema</b>	-0.6878	-0.0641	0.6175	0.6823
<b>Performing arts</b>	-0.6645	0.1084	0.7713	0.6909
<b>Cultural sites</b>	-0.7902	-0.3151	0.6360	0.7635
<b>2015</b>				
<b>Cinema</b>	-0.6719	-0.0782	0.6689	0.6325
<b>Performing arts</b>	-0.6650	0.1074	0.7590	0.6671
<b>Cultural sites</b>	-0.7530	-0.1684	0.6914	0.6867

While education can be an important factor to identify absolute zeros (due to the high and negative correlations), forecasts of recoverable zeros rely mainly on other variables rather than education. These results suggest that, education plays a role in shaping individuals' cultural participation and that this role varies between activities, being stronger as we consider highbrow activities with a larger symbolic content. This pattern remains stable over time as differences in correlations between 2006 and 2015 are minor.

In order to provide a more thorough insight, in Table 6 we report the estimated marginal effect of education on the probability of being an absolute or recoverable zero, or showing positive attendance, either with low or high demand. These effects are always computed considering *primary education or lower* as the reference category. In order to check the robustness of the effect of education, we have computed these effects at two different points, changing the *ceteris paribus* clause. Thus, we evaluate the marginal effects:

- (1) at the observed values of the independent variables
- (2) as in the previous case but fixing income at its mean (i.e. everything changes but income)



For each activity, comparison of rows (1) and (2) only implies a change in the reference income level. We interpret this difference as the result of relaxing the ceteris paribus clause just for the income variable. Hence, results may be understood as related to the underlying effect of income.

**Table 6. Marginal effects of education (in %)**

	No participant		Participant						
	Absolute zero		Recoverable zero		Low demand		High demand		
	Sec Ed	Ter Ed	Sec Ed	Ter Ed	Sec Ed	Ter Ed	Sec Ed	Ter Ed	
<b>2006</b>									
<b>Cinema</b>									
(1) At observed values	-11.572	-21.177	<i>-2.097</i>	<i>-4.116</i>	3.991	6.428	9.678	18.866	
(2) At observed values except income (at its mean)	-11.775	-21.507	<i>-2.308</i>	<i>-4.589</i>	4.314	6.900	9.770	19.195	
<b>Performing arts</b>									
(1) At observed values	-11.927	-22.186	<i>-1.006</i>	<i>-4.200</i>	6.785	12.340	6.149	14.046	
(2) At observed values except income (at its mean)	-12.023	-22.333	<i>-1.156</i>	<i>-4.633</i>	7.120	12.955	6.059	14.011	
<b>Cultural sites</b>									
(1) At observed values	-15.705	-31.431	<i>-4E-06</i>	<i>-5E-06</i>	6.253	8.970	9.452	22.461	
(2) At observed values except income (at its mean)	-16.199	-32.452	<i>-4E-06</i>	<i>-5E-06</i>	6.714	9.643	9.485	22.809	
<b>2015</b>									
<b>Cinema</b>									
(1) At observed values	-8.136	-16.827	-5.017	-7.005	4.690	7.811	8.463	16.021	
(2) At observed values except income (at its mean)	-8.282	-17.103	-5.365	-7.630	5.240	8.625	8.407	16.109	
<b>Performing arts</b>									
(1) At observed values	-13.604	-19.470	<i>2.671</i>	<i>-5.560</i>	6.061	11.189	4.872	13.841	
(2) At observed values except income (at its mean)	-13.668	-19.551	<i>2.484</i>	<i>-6.303</i>	6.490	12.176	4.694	13.678	
<b>Cultural sites</b>									
(1) At observed values	-11.739	-29.006	<i>-1E-06</i>	<i>-3E-06</i>	5.633	11.020	6.106	17.986	
(2) At observed values except income (at its mean)	-12.145	-30.325	<i>-1E-06</i>	<i>-3E-06</i>	6.123	12.127	6.022	18.198	

Note: not significant (at the 5 percent level) marginal effects in italics

Overall, we find that, for both considered years and the three cultural activities, the higher the level of education the larger the drop in the probability of being an *absolute zero* and, simultaneously, the larger the rise in the probabilities of *low* and *high attendance*. Marginal effects on recoverable zeros are usually the smallest and not significant in most cases. More specifically, marginal effects for people with tertiary education do not just involve becoming participants, but also going on to exhibit a large demand. For secondary education, marginal effects are lower and, additionally, it seems that getting a secondary degree makes people more prone to participate but not necessarily with a high demand for highbrow activities.

Between row comparisons suggest that potential measurement errors due to collinearity of education with income are quite small. It is noteworthy to mention that the probability of leaving the absolute non-attendees group (and, thus, becoming a participant) as education increases is lower for cinema, being this effect larger in 2015. Furthermore, as education increases, people most likely move from absolute zeros to attendants of highbrow activities as shown by the non-significant marginal effects of becoming a recoverable zero for these

activities. This impact of education on cultural participation is especially large in the case of visits to cultural sites. Overall, it seems that education has a larger effect on highbrow activities rather than cinema.

Finally, in Table 7 we display the marginal effects of income on the probabilities of participation and intensity of attendance, in order to assess its importance relative to education. The marginal effect of income on the probability of exhibiting a high demand does not increase for highbrow activities, in fact it is slightly larger for cinema. Therefore, although income may be related to both individual's tastes and social status (affecting cultural participation) and financial restrictions (affecting intensity of attendance), in contrast to the effect of education, income alone does not seem to increase individuals' high demand of highbrow activities more than popular culture demand.

Furthermore, by comparing marginal effects in Tables 6 and 7, it is clear that, although the effect of income is significant, it is much lower than that of education. For example, to achieve the same increase in the probability of having high demand of any cultural activity associated to a change from primary to tertiary education, we would need to increase individual's weighted income in, at least, 30.000€, which means to triplicate the average income.

**Table 7. Marginal effects of income (in %)**

	No participant	Participant		
	Absolute zero	Recoverable zero	Low demand	High demand
<b>2006</b>				
<b>Cinema</b>				
(1) At observed values	-0.351	-0.286	0.086	0.550
(2) At observed values except education (at its mean)	-0.394	-0.329	0.142	0.580
<b>Performing arts</b>				
(1) At observed values	-0.262	-0.486	0.299	0.450
(2) At observed values except education (at its mean)	-0.282	-0.524	0.356	0.450
<b>Cultural sites</b>				
(1) At observed values	-0.910	0.000	0.363	0.547
(2) At observed values except education (at its mean)	-1.001	0.000	0.429	0.572
<b>2015</b>				
<b>Cinema</b>				
(1) At observed values	-0.509	-0.248	0.201	0.556
(2) At observed values except education (at its mean)	-0.553	-0.277	0.272	0.557
<b>Performing arts</b>				
(1) At observed values	-0.210	-0.553	0.307	0.455
(2) At observed values except education (at its mean)	-0.227	-0.584	0.358	0.453
<b>Cultural sites</b>				
(1) At observed values	-0.849	0.000	0.396	0.453
(2) At observed values except education (at its mean)	-0.921	0.000	0.453	0.467

\* Given the definition of income, these marginal effects are associated with a change in income of 1000 euros.

## 5. CONCLUSIONS

The main objective of this paper is to analyze the role of education on participation in three cultural activities: cinema attendance, live performances and visits to sites of cultural interest. To do so, we estimate a Zero Inflated Ordered Probit model using data from the 2006 and 2015 modules of the European Union Statistics on Income and Living Conditions (EU-SILC). This specification allows us to consider participation and intensity of the demand as a joint decision. The use of two different modules of EU-SILC allows to check the stability of the results over time. However, these two surveys cannot be linked over time. Thus, estimated effects cannot be interpreted as causal effects but reflecting correlations.

Given the diverse nature of the three cultural activities considered, we find quite different patterns of consumption. In what concerns cinema participation, for low education attainments, we observe a larger demand, compared to performing arts and visits to sites of cultural interest. Cinema is the most popular activity, probably because it is produced by an industry whose objective is to reach as much public as possible. Regarding the performing arts participation, non-attendants are the most easily recoverable, especially those with secondary education, whose probability of belonging to the *recoverable zero* category is the largest of all individuals' groups. When considering visits to sites of cultural interest, such as monuments and museums, the most striking outcome is the strong polarization in attendance. As individuals' educational achievements increase, the change from absolute zero to high demand attendees is especially high.

By distinguishing between participation and intensity of demand, we find that the gender effect is not as simple as it is sometimes asserted. Women are more likely to participate in the three activities considered but, conditional on their participation, they only attend more frequently than men to performing arts. We also find an increasing probability of attending performing arts and visiting sites of cultural interest as people get older, opposite to the estimated effect for cinema.

Taking advantage of the data on self-declared health status, seldom included in other surveys, we find that, as expected, healthier individuals exhibit higher rates of participation and attendance to cultural activities.

Additionally, consistent with the *normal good* nature of cultural goods, income has a positive, and concave, effect on both participation and intensity of consumption of the three cultural activities. The inclusion of this variable allows us to get a more accurate estimate of the effect of education on cultural participation as education and income are closely correlated. Our results suggest that, for cinema and performing arts, income acts mainly as a financial barrier, since its effect is larger on the intensity of attendance rather than on the participation decision. In contrast, regarding visits to cultural sites, the income effect is larger for the participation part of the decision, indicating that income is related to tastes and, in sociological terms, to class position (as in Willekens and Lievens, 2014).

Related to individuals' cultural capital, we find that higher levels of education are associated with higher chances of participating in cultural activities. In addition, getting a secondary degree makes people more prone to participate but to a lesser extent than having a university degree. We have also found that the education effect varies between activities, being its marginal effect more relevant for highbrow activities. These results regarding formal education are consistent with the idea that cultural consumption involves the comprehension of symbolic elements, that are more elaborate for highbrow than popular culture.

In contrast to the effect of education as we move to highbrow activities, the fact that the marginal effect of income on cinema is the largest suggests that, given a certain level of education, an increase in income will bring more people to the cinema than to theaters or museums. On the contrary, for a given level of income, more educated individuals are more likely to attend highbrow activities. Hence, although income may be related to the individual's tastes and preferences (affecting cultural participation), income alone does not seem to increase individuals' capability of decoding the symbolic content of highbrow culture. In sum, education seems to be more crucial in determining cultural participation than income.

All these findings present a dilemma when designing cultural policy. On the one hand, in order to reduce the importance of economic restrictions, policy makers could consider reductions in the indirect tax paid for cultural goods, or increases in the subsidies for their production. The consequent fall in prices would have a direct effect on cultural demand. However, these fiscal policies would be regressive, benefiting more those individuals with higher income (Prieto-Rodriguez *et al.*, 2005). Moreover, the effectiveness of this policy in order to promote highbrow culture can be limited if, as suggested by our results, financial restrictions are more relevant for lowbrow activities.

On the other hand, in order to enhance cultural participation through individuals' cultural capital, cultural policy should be integrated into education policies oriented to improve people's taste for the arts. A main drawback of any policy aimed at the formation of artistic tastes is that its effects will only arise in the long term. In the past, policies of *tastes' training* were combined with cultural programs on radio and television. Nowadays, technological changes have eliminated the captive audiences of these media. Although supply is now much diverse, only those that are already interested in the arts demand these contents. Therein lies the importance of early and eventually compulsory education to develop artistic interests and tastes among the population.

### Acknowledgements

This study received funding from Government of Spain (projects ECO2016-76506-C4-1-R and ECO2017-86402-C2-1-R) and the Regional Government of the Principality of Asturias (Severo Ochoa programme). We are especially grateful to Obra Social Fundación la Caixa that generously funded the working paper that was the beginning of this research. The usual disclaimer applies.

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