



ACEI working paper series

**The consumption of cultural goods through the internet.  
How is it affected by the digital divide?**

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AWP-04-2016

Date: May 2016

# **The consumption of cultural goods through the internet.**

## **How is it affected by the digital divide?**

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### **Abstract:**

Cultural engagement through the internet is becoming a more popular way of cultural participation, as computers and mobile devices are the outlet for more cultural experiences. On the one hand, this may help to access a wider variety of cultural contents in the form of digital goods. On the other hand, the digital divide could further exacerbate the stratification of cultural consumption. Using data from the 2012 Survey of Public Participation in the Arts for the United States, we explain the determinants of cultural participation through digital engagement for highbrow and lowbrow cultural activities, explicitly accounting for the selection in the sample of internet users. Our results suggest different determinants of these two categories, especially for the role played by age and education.

**Keywords:** cultural participation, digital engagement, interne cultural consumption, selection, Heckman selection probit model.

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\* Corresponding author. A first version of this paper was presented at the *VI Workshop on Cultural Economics and Management*, 21-22<sup>nd</sup> November 2014, Universidad Nebrija de Madrid, and at the *Seventh European Workshop on Applied Cultural Economics*, 3-5<sup>th</sup> September 2015, Austrian Institute of Economic Research (WIFO), Vienna. The authors are grateful to all participants for comments. The usual disclaimers apply.

## 1. Introduction

The role of Information and Communication Technologies (ICTs) has received increased attention from economists over the past thirty years, with extensive literature aimed at understanding their impact on economic growth, firm productivity and firm efficiency (Castiglione and Infante, 2014). The debate then shifted to measuring the impact of ICTs on different aspects of daily life as General Purpose Technologies (GPTs), i.e., fundamental technological innovations that are characterized by pervasiveness, technological dynamism and innovative complementarities (Brynjolfsson and McAfee, 2011). Digitization has transformed the access to activities and content and, in the recent years, a greater interest has emerged in analysing who is lagging behind in the digital changeover, why, and what are the implications for content creators and cultural institutions. After an increasingly rapid penetration of digital devices and internet connections, the opportunities for accessing content and engaging in different activities have dramatically changed in everyday life (PEW, 2014). The digital divide, defined as the gap between those who have and do not have access to the new forms of information technology (see van Dijk, 2006), is found in many dimensions: regarding access rates among social groups, with smaller differences in countries with higher penetration rates; regarding uses, such as education and, financial services, with differences in their “capital enhancing” nature; as well as regarding group characteristics, such as digital “natives” and differences by age, race, place of residence, income and educational level (van Dijk, 2006; DiMaggio, 2014; Hargittai and Hsieh, 2013).

The first researches, developed during the phases of internet diffusion, contributed to understand the digital inequality in terms of differences in access, referred to as the first-level digital divide (Wei and Hindman, 2011; and Hargittai and Hsieh, 2013). In the following years, when penetration rates in developed countries increased dramatically, and the use of internet was widespread, scholars started to see the digital divide as a complex and dynamic phenomenon that is essentially multifaceted, taking into account four dimensions of access: motivational, physical, skills and usage (van Dijk, 2006). The differences in skills and uses were referred to as second-level digital divide, with implications for the formation of human capital and social capital (Hargittai and Hsieh, 2013; and Wei and Hindman, 2011).

Changes in technology have also had an impact on the way in which culture is produced and consumed. Potts (2013) highlights that, surprisingly, very little is known about how digitization and the internet have influenced the demand for cultural goods, in comparison with the wide range of studies on how they have affected supply. According to Carey (1988), changes

in culture are intricately connected to changes in technology. ICTs have dramatically changed the market for the arts, typically leading to expanded audiences with access to more diverse cultural fare (Tepper et al., 2008). Since cultural participation through mobile equipment (smartphones and handheld devices) has increased across the entire population, the digital divide may also be of interest to cultural managers. Within different cultural goods, music is one of the goods that is most frequently consumed through digital equipment, and the behaviour of digital music consumers has been already studied (Peitz and Waelbroeck, 2005). But since only a few studies aim to explore the consumption of other cultural goods through ICT technologies (Ateca-Amestoy and Castiglione, 2014; Katsuura, 2008), the impact of the digital divide and its implications on cultural participation has been surprisingly neglected in favour of other means of cultural engagement, such as attendance. This is of interest when creating digital goods for end users, and also when considering that digital cultural goods are often precedent or posterior complements to attendance. The consumption of cultural content via the internet access is perceived by consumers as an opportunity to extend the physical experience beforehand, enhancing the visit itself and also after it has finished (Kuflik et al, 2015). This paper aims to fill these lacunae, examining the determinants of online engagement for highbrow and lowbrow cultural activities, explicitly accounting for the selection in the sample of internet users. The empirical strategy used is such that it allows to control for first order digital divide (in the selection of the sample of internet users), and for second order digital divide (by considering different types of internet cultural uses). Social distinction and other social phenomena that appeared in the social practice of cultural activities might well replicate, mitigate or become amplified in the new digital realm.

Our analysis uses data taken from the 2012 edition of the *Survey of Public Participation in the Arts* (SPPA2012), a survey periodically run as a supplement to the *Current Population Survey* (CPS) by the United States' Bureau of the Census, which is representative of the adult population. As early as 1993, the National Endowment for the Arts adopted a tripartite definition of cultural participation: through attendance at live arts events; through the media, by watching or listening to arts programs, and through personal involvement, be it by creating or displaying art or by performing either as an amateur or as a professional (NEA, 2010). Here, we concentrate on access to digital content via the internet, and we focus on a special module that contains information on the digital practices of individuals, and which considers access via the internet to a list of cultural manifestations, such as performing arts and visual arts. We consider internet consumption of highbrow music (jazz, classical music and opera), lowbrow music (Latin, Spanish, salsa, rock,

pop, country, folk and hip-hop), theatre, dance and ballet, visual arts and, last, books and literature. In our sample, some individuals report having accessed the arts via the internet, while others have not. Among this latter group, we have both internet users and non-users. Thus, we model the probability of consuming each one of those six types of cultural content, accounting for the selection of the sample of internet users. This implies that we are able to explore the determinants of cultural engagement by means of the internet, controlling for the fact that individuals must first of all be internet users, and that it is well acknowledged that internet access still depends on personal economic and social conditions (DiMaggio and Hargittai, 2001; Hargittai and Hsie, 2013; Hoffman and Novak, 1998).

## **2. On digital access to cultural goods**

Individuals face many choices in their leisure time and, once cultural activities have been chosen, they have to decide how to access and experience them. Economics has explained engagement in terms of phenomena such as rational addiction or learning by consuming. Sociological research has explained cultural consumption in terms of cultural capital, by which high status was linked to highbrow cultural consumption (Bourdieu, 1984). According to Peterson and Kern (1996) low status is linked to the univorous consumption of culture, whereas high status is omnivorous, or even voracious (Katz-Gerro, 2010). Recent research on consumption patterns documents certain major shifts over the past decade, blurring the link between status and cultural engagement, with the major differences emerging from breadth and intensity (López-Sintas et al., 2014; Van Eijck and Majorana, 2013).

In fact, even though we consider the cultural consumption through digital equipment, we should take into account the digital divide. Regarding first-order digital divide, Norris and Inglehart (2013) and Hargittai and Hsie (2013) identify metropolitan status, race, education, income and age as relevant variables. Apart from the fact that there are distinct behavioural differences between digital “natives” and the rest of the population, there might be age barriers potentially linked to the decline in cognitive ability in old age (Freese et al., 2006). Authors recognize that, over time, some of those gaps have closed in the United States, though access conditions and where people can go online is still a differentiated opportunity regarding digital media (Hargittai and Hsieh, 2013). Regarding second-order digital divide, some authors have found evidence of the emergence of a “digital distinction” (Zillien and Hargittai, 2009), so that

uses of the internet are highly dependent on factors such as age, education and income (Van Deursen and Van Dijk, 2014; Van Deursen et al., 2015). Other authors have highlighted the existence of a gender gap on the internet (Bimber, 2000; Ono and Zavodny, 2003), with some uses being more “capital –enhancing than others”, a fact with important implications on human and social capital at the individual and the aggregate level (Hargittai and Hsieh, 2013).

Technology has dramatically changed the market for the arts, especially in terms of the expansion and diffusion of culture, given that more materials are available to more people (Potts, 2013; Tepper et al., 2008). This has two implications. On the one hand, it seems that that variety might only be enjoyed by a relatively small group of people that already participates in culture and, at the same time, knows well the affordances of internet (DiMaggio, 2014). On the other, the increase in variety could provide cultural managers with opportunities to build more extensive and intensive relations with their patrons (Bakhshi and Throsby, 2010). Digitization has also blurred the relationship between the production and consumption of cultural digital goods, with researchers coining and using terms such as prosumption or produsers (Bruns, 2013; Nakajima, 2012). The consumption of cultural goods through digital equipment is not necessarily less active of live attendance; in fact individuals can create online their content (Brake, 2014), and Swerdlow (2008) asserts that cultural goods in the digital era are consumed in a more active way.

We do not know much about the determinants of cultural participation through the internet, apart for the aforementioned example of music and of cinema. In any case, it turns out that some determinants of the digital divide (metropolitan status, education, income, age) are also important variables for on-site cultural attendance. Moreover, the consumption of cultural goods under different media is often related, though not always in the same way. Nguyen et al. (2014) find that the online consumption of music has no impact on its physical consumption, whilst Ateca-Amestoy and Castiglione (2014) report that the consumption of visual arts content on mobile devices has a negative exposure effect over the probability of visiting museums, and that museum-going has a positive effect over both mobile and internet consumption.

According to PEW (2015), new technologies have brought about three major digital revolutions both regards technological change (broadband and mobile), and in the way those technologies are used (social). In fact, the main revolution is linked to the way people access information and share it with each other.

### 3. Data and hypotheses

The data used in this analysis have been taken from the 2012 *Survey of Public Participation in the Arts* (NEA, 2013). They were collected from a sample of people aged over 18 in May 2012. This dataset compiles information on participation in the arts by US citizens attending the so-called “benchmark activities”, also covering other types of cultural practice, such as the consumption of cultural goods through the media and some types of active artistic practices. A total of 37,266 questionnaires were completed by individuals aged over 18 for a representative sample of households in the USA. The structure of the survey is such that there are core and non-core modules, so not every respondent is asked all the questions in the survey. This limits the analysis that can be made (as some variables cannot be jointly introduced in the analysis).

Table 1 presents the variables used in our models. First we explain the probability of intensity of use of internet for any purpose; this is done by estimating an ordered probit model. For each of the internet cultural participation, given that our dependent variables are binary, taking value 1 if the individual responds affirmatively and 0 otherwise, we estimate six probit models with selection for the set of cultural activities consumed via the internet: music (highbrow and lowbrow), theatre, dance and ballet, visual arts, and books and literature (Heckman, 1979). The model is constructed in such a way that we can see the influence of each explicative variable has on both the probability of cultural participation through the internet, accounting for the fact that there is a previous process (the selection part of the model) that explains the probability of internet usage. Both processes are jointly estimated in a single model, a Heckman probit model (Heckman, 1979).

We should remember that these are filtered questions, as we only have observations for those individuals that declared using the internet. For example, in our sample, 69.3% reported using the internet (6,339 people), of whom 6.32% used it to access the visual arts (*intvisualarts* variable, accounting for 1.10% of the whole sample). Due to the structure of the 2012 SPPA, when we combine the information from different modules, we end up with a sample of 9,312 observations for the estimation.

TABLE 1: DESCRIPTIVE STATISTICS

VARIABLE	QUESTION IN THE 2012 SPPA	MEAN	S D	MIN	MAX
<i>inthighmusic</i>	Use the internet to watch, listen to or download any Jazz	0.280	0.449	0	1
	Use the internet to watch, listen to or download any Classical music				
	Use the Internet to watch, listen to or download any Opera				
<i>intlowmusic</i>	Use the internet to watch, listen to or download any Latin, Spanish, or salsa music	0.022	0.147	0	1
	Use the internet to watch, listen to or download any Other music, such as rock, pop, country, folk, rap or hip-hop				
<i>inttheatre</i>	Use the internet to watch, listen to or download any Theater productions, such as a musical or stage play	0.006	0.074	0	1
<i>intdance</i>	Use the internet to watch, listen to or download any Ballet, modern, or contemporary dance	0.007	0.086	0	1
	Use the internet to watch, listen to or download any Other dance programs or shows				
<i>intvisualarts</i>	Use the internet to watch, listen to or download any Programs or information about the visual arts, such as painting, sculpture, graphic design, or photography	0.011	0.103	0	1
<i>intbook</i>	Use the internet to watch, listen to or download any Programs or information about books or writers	0.021	0.143	0	1
	Use the internet to watch, listen to or download any Books, short stories, or poetry read aloud				

In order to explain internet participation we consider variables both linked to the digital divide and to cultural consumption. In particular our independent variables are divided into different categories: demographic variables (age, sex, and race); cultural variables (education); employment status (employed, unemployed, not in labour force, and part time employed); health status (disabilities); household resource variables (income, marital status, number of children); and geographical variables (size of city of residence). As explained in Table 2, some of those variables determine the probability of internet access, some others explain internet cultural usage, and some others explain both.

Age can influence cultural participation in different ways: through a life-cycle effect, such as entering the labour market, childbearing, and care or ill health, and lower mobility related to advanced age (Ateca-Amestoy, 2008), and through learning-by-consuming effect (Alderighi and Lorenzini, 2012 and Castiglione and Infante, 2015) or rational addiction (Sisto and Zanola, 2010). For our analysis of digital engagement, we should further take into account that young people are more likely to be digital “natives”, thus holding an advantage over older people in the use of ICTs (Norris and Inglehart, 2013).

TABLE 2. VARIABLES USED IN THE ANALYSIS

VARIABLE	DEFINITION		MEAN	S D	MIN	MAX
<i>De – Vector of demographic variables</i>						
Age		B				
	age1 (18-24)		0.084	0.278	0	1
	age2 (25-34)		0.165	0.371	0	1
	age3 (35-44)		0.170	0.375	0	1
	age4 (45-54)		0.188	0.391	0	1
	age5 (55-64)		0.182	0.385	0	1
Sex	female	B	0.529	0.499	0	1
Race	Ethnic:	C				
	white		0.839	0.368	0	1
	black		0.088	0.283	0	1
	otherrace		0.073	0.261	0	1
<i>S - Vector of cultural variables</i>						
edu	Highest level of education	B				
	edu: college or above		0.403	0.491	0	1
<i>E – Vector of employment status</i>						
	employ (employed)		0.609	0.488	0	1
	unemp (unemployed)		0.047	0.212	0	1
	notforce (not in the labor force)		0.343	0.475	0	1
	emplpt (part time employed)		0.115	0.319	0	1
<i>Dis - Vector of Health status</i>						
Disabilities		A				
	disasence		0.076	0.265		1
	disamotor		0.090	0.286	0	1
<i>H - Vector of household resource variables</i>						
Hinc	Household income	B				
	hinc1 (less than 25,000 USD)		0.222	0.416	0	1
	hinc2 (25,000 to 49,000 USD)		0.260	0.439	0	1
	hinc3 (50,000 to 99,999 USD)		0.317	0.465	0	1
	hinc4 (more than 100,000 USD)		0.201	0.401	0	1
Marital	Marital Status	C				
	married		0.578	0.494	0	1
	widowed		0.066	0.248	0	1
	divorced		0.219	0.414	0	1
	single		0.137	0.344	0	1
Child	Number of children	C				
	no children <18 at home		0.716	0.451	0	1
	child1 (1 child <18 at home)		0.117	0.322	0	1
	child2 (2 children <18)		0.108	0.310	0	1
	child3plus (more than 3 children <18)		0.059	0.236	0	1
<i>O - Vector of Geographical Variables</i>						
Size of habitat		C				
	central		0.224	0.417	0	1
	balance		0.372	0.483	0	1
	non_metro		0.216	0.411	0	1
	other		0.188	0.391	0	1

Data from the 2012 Survey of Public Participation in the Arts (NEA, 2013).

B: explanatory variable for both parts of the model; A: explanatory variable for access to internet; C: explanatory variable for cultural use of the internet.

Gender is expected to operate in the two processes involved in the model. On the one hand, it can influence the probability to be an internet user (Wei and Hindman, 2011); on the other hand, it can influence cultural attendance (Seaman, 2005). There is no intrinsic reason to expect different participation rates between men and women, although different experiences during childhood may play a role, e.g. boys tend to participate more in sports and less in arts and music than girls (Ateca-Amestoy and Castiglione, 2014; Katsuura, 2008). For second-order digital divide, there seems to be a tendency for more “capital-enhancing” uses for males (DiMaggio and Hargittai, 2001). For ethnic differences, we consider the possibility that ethnicity may have different patterns in cultural consumption (as found by Seaman, 2005), and that there persists differences on digital access (Hoffman and Novack, 1998).

The importance of cultural capital and, consequently, of education is related to the human capital and digital skills and affordances of the individual (DiMaggio, 2014). Regarding cultural goods, this determines the skills of the individual to disentangle and enjoy the symbolic dimension of cultural goods (Borgonovi, 2004). The importance of this is that the enjoyment of cultural goods may require interpretation skills and shared cultural capital. We expect that the education effects operate through the probability of being an internet user (the selection model), and that the effect is reinforced in the probability of each cultural internet use.

The effect of employment status on cultural participation is at least partially the result of the higher personal income and time availability. However, individuals may use participation in digital culture as a mark of social distinction, as a cue to signify and reinforce membership of the upper-middle classes.

We consider individual health status, measured by two binary variables that determine whether an individual has any form of sensory or motor disability. The inclusion of these variables allows us to isolate the effect of diminishing health capital with age, from pure age of life-cycles effects (Seaman, 2005). The effect of health status has often been neglected in the study of the determinants of cultural participation (exceptions are Ateca-Amestoy and Castiglione, 2014; Bille, 2010; NEA, 2015), so it is not easy to predict the impact that different kinds of disabilities may have on digital participation.

A number of factors could determine the positive association between income and participation, such as being able to afford leisure activities, or the greater opportunity cost of time (Zieba, 2009). Income is also related to the digital divide, as there is evidence that higher income is associated with higher digital access and use (Wei and Hindman, 2011). This is due to the fact

that high income may lead to better household digital equipment that, in turns, results in better access to enhance individual digital skills. Social inequality and digital inequality may reinforce one another (Hargittai and Hsieh, 2013).

Household composition variables as partnership and the number of children are also considered in this analysis to account for the time available for individuals and for the opportunity cost of the time dedicated to leisure (Zieba, 2009). While time constraints determine substitution effects between leisure activities in physical consumption, it is difficult to predict the impact that those variables have on the consumption of cultural goods through digital equipment.

Finally, following Ateca-Amestoy (2008) we consider whether the individual lives in a city, a town or in a metropolitan or non-metropolitan area. While these factors are important for attendance, with a clear pattern of urban consumption, little is known about their influence on digital cultural consumption. Regarding digital consumption, there has been evidence of greater access in the urban areas.

#### **4. Methods and results**

We begin our analysis with the modelling of the intensity of general internet access, without considering the actual activity itself by estimating an ordered probit, given that we have an ordered variable that takes values from 0 to 7. The values correspond to the following alternatives: no-access, less than every few weeks, every few weeks, once or twice a week, three to five times a week, about once a day, several times a day (the reported order of the scale in the questionnaire is reversed, with higher values implying a higher frequency of access).

For the analysis of the models that explain online cultural activity, we explicitly consider the selection of the sample of internet users; otherwise, the results of the estimated probit model on the sample of internet users may be biased. Therefore, we consider a probit model with selection: In the Heckman selection probit model, there is a part of the model that explains the probability of being an internet user, and another part that explains the probability of engaging in that particular art form (Heckman, 1979).

The model that explains the intensity of internet access (Table 3, first column) reflects some of the well documented negative effects of age (with groups aged over 25 determining a lower probability of more frequent access in a monotone and increasing way).

TABLE 3. INTENSITY AND CULTURAL DIGITAL ENGAGEMENT

	Internet intensity of Access (1)	Internet highbrow (2)	Internet lowbrow (3)	Internet theater (4)	Internet dance and ballet (5)	Internet visual arts (6)	Internet book and literature (7)	Selection (8)
age2: 25-34	-0,212***	0,128	-0,207**	0,126	-0,128	0,163	-0,014	-0,228***
age3: 35-44	-0,418***	0,257**	-0,496***	0,029	-0,384**	0,042	-0,022	-0,422***
age4: 45-54	-0,694***	0,065	-0,582***	0,240	-0,209	0,029	-0,072	-0,649***
age5: 55-65	-0,795***	0,119	-0,739***	0,219	-0,339*	0,023	-0,022	-0,743***
age6: 65+	-1,163***	0,184	-1,175***	-0,069	-0,719**	-0,277	-0,111	-1,251***
(baseline: age1: 18-24)								
female	0,051	-0,110**	-0,066	0,073	0,317***	-0,014	0,267***	0,071*
(baseline: male)								
black	-0,326***	-0,003	-0,215***	-0,206	0,009	-0,273**	-0,204**	
otherrace	-0,029	-0,076	-0,174**	-0,309**	0,157	-0,111	-0,056	
(baseline: white)								
edu: college or above	0,619***	0,316***	0,109	0,128	0,193*	0,395***	0,390***	0,604***
(baseline: less than college)								
unemp	-0,117**	-0,298***	-0,056	-0,014	0,053	-0,220	0,013	
notforce	-0,298***	0,005	-0,098*	0,140	0,068	-0,027	0,036	
emplpt	0,175**	0,151**	0,147**	0,258**	0,196**	0,164*	0,031	
(baseline: employedft)								
hinc1: less than 25000USD	-0,139***	0,098	-0,025	-0,085	0,108	-0,041	-0,032	-0,251***
hinc3: 50000 to 99999USD	-0,050	0,159**	0,155**	0,041	0,090	0,083	0,182**	0,288***
hinc4: more than 100000USD	-0,183***	0,301***	0,303***	0,022	0,141	0,099	0,371***	0,514***
(baseline: hinc2: 25000 to 49999USD)								
disasense	0,277***							-0,163**
disamotor	0,485***							-0,384***
(baseline: no impeding disability)								
widowed	-0,182***	0,038	0,163	0,144	-0,041	0,051	-0,078	
single	0,007	0,153**	0,212***	0,223**	-0,073	0,046	0,103	
divorced	0,099**	0,178**	0,123**	-0,030	-0,128	0,156*	0,076	
(baseline: married)								
child1	-0,035	-0,017	0,078	-0,158	-0,053	-0,137	-0,044	
child2	-0,080	-0,348***	0,166**	-0,105	-0,008	-0,299***	-0,158*	
child3plus	-0,121*	0,152	0,165*	0,006	0,303**	0,097	0,003	
(baseline: no children)								
balance	0,002	-0,157**	-0,064	-0,007	-0,178**	-0,240***	-0,168***	
non metropolitan	-0,021	-0,229***	-0,075	-0,005	-0,274**	-0,310***	-0,106	
not identified	-0,018	-0,239***	-0,033	-0,038	-0,186*	-0,141	-0,083	
(baseline: central)								
_cons		-1,436***	-0,091	-2,062***	-1,889***	-1,761***	-1,676***	0,877***
Obs: 9312								

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We do not find a statistically significant gender effect in our sample. Being black determines a lower frequency with respect to being white, although no statistically significant

effect is found for other non-white ethnic groups. A college level education or higher increases the probability of more intense access, as well as being employed part time rather than full time. A negative effect is found for the unemployed and people outside the labour force. Household income has a non monotone effect; we consider income by quartiles and, compared to being in the second one, being in the first or in the fourth one decreases the intensity of internet usage.

For people with disabilities, there is a positive effect both for sensory and motor disabilities, indicating a higher probability of more frequent access. With respect to being married, being a widow decreases the probability, while being single increases it. Last, having children only has an effect (positive) for individuals with three small children or more. In this estimation of frequency, it is very likely that there are factors that influence access (the difference from no usage at all to some usage - even if very moderate), and other factors that determine the activity itself.

The previous results inform the choice of explanatory variables for the selection part of the probit models that explain the probability that an individual engages online with each one of the six cultural activities considered here.

The results for the probit models that explain the probability that an individual digitally engages with each activity are presented in columns 2 to 7. We report those results as obtained for the 0, 1 values of the dependent variable, i.e. once we have controlled for the selection made when considering the subsample of users, instead of the whole sample. The estimates for the internet usage part of the model are reported in column 8. For internet access, a part of the model that is common to all the estimated models, we find a monotone and negative effect for all age categories over 24. There is a small but positive effect of being female, and a much larger effect of holding a university degree or higher. Income has a positive monotone effect. Both types of disabilities have a negative effect over the probability of accessing the internet, with a higher coefficient for motor disabilities than for sensory ones.

When considering the various types of cultural information goods, there are clear differences that emerge. The effects of some variables over the probability of accessing jazz, classical music and opera (column 2, for online consumption of highbrow music) go in the opposite direction to the probability of consuming Latin, Spanish, salsa, pop, rock and other styles (column 3, for online consumption of lowbrow music). For age, in the highbrow type, we find a positive effect for those aged 35-44 (a rather younger interval than the patrons of concerts of classical music), with no statistically significant effect for any other age group. However, for the lowbrow type, there is a negative and monotone age effect. Being a female increases the probability of

consuming highbrow music online, with no statistical significance for the lowbrow alternative. Race has a negative effect over lowbrow (with no evidence for classical music). Education has only a positive effect for highbrow. There are more similarities for variables that may capture the availability on time, equipment and income: labour status (a positive effect for being employed part-time for both types, negative for unemployed in the highbrow type, and negative for those outside the labour force in the lowbrow), household income (with respect to the second quartile, positive and monotone effects for the third and fourth), and marital status (with respect to being married, both single and separated or divorced increase the probability of either type of online consumption of music). Last, while the habitat has a statistically significant and negative effect in the highbrow model, nothing is found for lowbrow music. It could be the case that the digital consumption of highbrow music is much more closely linked to having been exposed to live highbrow music (more frequent in big metropolises than in any of the other types of habitat considered), whereas the digital consumption of lowbrow music might be less related to the live supply, and more to music heard on the media or in the form of recordings, such as tapes, CDs and DVDs.

For the online consumption of theatre productions (column 4), we do not find statistically significant effects by age, nor do we find any gender effect (though there is the regularity than being a women increases the probability of being a theatre patron, holding all other factors equal). Unlike the probability of consuming highbrow and lowbrow music, the probability of consuming theatre content is not influenced by income, neither by education. However, the time availability derived from having a part time job with respect to having a full time one also determines the higher probability of this type of consumption. The same is found for being single (a positive effect).

A different pattern arises for dance and ballet (column 5), where there are statistically significant age effects (for some categories, this is negative). There is probably a higher interest among women, as this increases the probability of digital access for dance, as well as for levels of education of college or above. The effect of part time employment is also positive, as well as having three or more children. Interestingly, the effect of the type of habitat seems to indicate that this type of cultural activity may be subject to some positive effect of exposition to live performances that are more likely to take place in big urban agglomerations.

Internet consumption of visual arts can be a substitute or a complement for museum attendance. For this case (column 6), we do not find statistically significant age effects, and we

see some racial differences and no gender effect. The level of education has a positive effect on the probability of this type of engagement, as part time job and being divorced. The effect of urban size makes that, with respect to urban areas, living in a different place decreases the probability of engagement.

Last, we consider the digital consumption of literature contents or information on column 7. The results do not exhibit any age effect, though being a female increase the probability. College education has also a positive effect, as well as income (for the two upper categories). For variables that determine other resources availability we do not find a statistically significant effect and, once more, we find that not living in a metropolitan area has a negative effect. This last result is somehow surprising, as one may expect that readers and consumers of literature contents online do not face the constraint that close substitutes of those goods (such as printed books, programs and contents broadcasted by other media) are only available in big urban areas, with the possible exception of literature festivals.

## **5. Conclusions**

This paper analyses the online consumption for six cultural activities (highbrow music, lowbrow music, theatre, dance and ballet, visual arts, and book and literature) using data from the 2012 *Survey of Public Participation in the Arts* in the United States.

From the comparison of the results of the six online cultural activities, after considering the factors that determine being an internet user, we can find common and diverse patterns. According to our results it appears that some cultural activities are subject to age effects. One would expect that, due to better digital skills, being at higher age categories decreases the probability of digital consumption. That is the case for lowbrow music and, partially, for dance and ballet. However, for highbrow music tastes, we have found that there is a positive effect for the group aged 35-44, opening chances for cultural managers to try to attract those ones to their digital and built auditoriums.

We found concluding evidence for gender effects for dance and ballet (positive for women), for books and literary content (positive for women), and for highbrow music (negative for women). The first results seem to replicate what happens in attendance to the performing arts, while the last one opens the opportunity for cultural managers to expand their audience.

Education determines the personal cultural capital, household income determines monetary resources and status, and occupational status and household composition determine time availability. The role of university education is statistically significant, and positive as expected, for highbrow music, dance, visual arts and books. For highbrow and lowbrow music and for books, income has a positive and monotone effect. For most of the practices, we find that statistically significant effects of the variables that model time availability. Last, one may expect that digital consumption would be related to the type of habitat only if there are exposition effects from attendance to internet consumption (i.e. people that live in places where there is a wider cultural supply are more likely to be aware and to consume content also online). This is the case for highbrow music, dance, visual arts, and books and literature.

The paper focuses on three original aspects. Firstly, it estimates the determinants of cultural consumption through the internet. This is important because, so far, most of the research on cultural consumption has focused on the physical aspect (attendance and recorded/printed media), and hence has not taken into account the impact of these technologies on the consumption of culture.

Second, in order to study online cultural consumption we have to take into account the digital divide in the population, since people that have no these technologies have not possibilities to be exposed to the digital consumption of culture (due to the first-order digital divide). Consequently, the second original aspect of this paper is a methodological contribution, as we explain second-order digital inequality for cultural uses. After estimating an ordered probit model to better understand the drivers of different degrees of intensity of internet general use, we select the variables for the estimation of six probit models with Heckman selection (the selection is due to the fact that we only observe online cultural use for those individuals that are indeed internet users).

Thirdly, researches on cultural participation usually analyze a single type of cultural activity and therefore any comparison of results across different cultural activities becomes extremely important. In this paper we compare the determinants of digital consumption for performing, visual arts, and books and literature. Within the performing arts we consider: highbrow and lowbrow music, theatre, dance and ballet.

Our results have different implications for cultural managers. In fact, managers of cultural institutions have to provide the means for consumers to access the intangible elements of their cultural assets in such a way that they can enjoy pleasant and meaningful experiences. More

often, cultural managers and curators do not only have to deal with physical objects and with live performances, but mainly with their symbolic values and with the “versioning” of the immaterial substrate of those cultural goods (Navarrete, 2013a and 2013b). This is further exaggerated when the information is delivered over a network. Free or freemium digital content delivered online can be understood as sampling; a strategy that can be used to achieve some of these goals: build awareness, obtain follow-on sales and visits, create a network, attract more eyeballs, and gain competitive advantage (Shapiro and Varian, 1998). Digitization has promoted the coexistence of superstars’ markets for “winner take it all” combined with niches in the “long tail”. Internet engagement faces fewer capacity constraints, as compared to the ones faced by superstars cultural institutions, when congestion may deteriorate the quality of the in-site experience.

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