Carlos Pestana Barros & Nicolas Peypoch
A Comparative Analysis of Productivity Change in Italian and Portuguese Airports

Carlos Pestana Barros, Marilena Vecco and Victor Blanco
Addiction At the Biennale of Venice

WP 14/2008/DE/UECE

WORKING PAPERS
ISSN nº 0874-4548
ADDICTION AT THE BIENNALE OF VENICE

Carlos Pestana Barros
Instituto Superior de Economia e Gestão (ISEG)
Technical University of Lisbon, Portugal
Department of Economics
Cbarros@iseg.utl.pt

Marilena Vecco
ICARE-University of Venice, Ca-Foscari, Italy
Department of Economics
mvecco@unive.it

Victor Maria Fernández Blanco
University of Oviedo, Spain
Department of economics
vfernan@uniovi.es

Abstract: In this paper we analyse the socio-economic characteristics (e.g. age, gender, education, nationality) associated with the probability of subscribing to an art review, among visitors of the Visual Arts Biennale of Venice taking into account the heterogeneity of the data. The analysis uses a data set from a questionnaire given in Venice in 2003 to ascertain the key characteristics of the Biennale visitors, (Bernardi, Pizzi and Vecco, 2004). A Bayesian random parameter logit model is used with Gibbs sampling to verify the hypothesis that subscribing to an art review given that the individual visits the Biennale, defines addiction to visual arts. This model outperforms the standard logit model since it takes into account the unobserved heterogeneity of the sample data. Some policy implications are presented.

1 Correspondent author
Keywords: Culture, Biennale of Venice, Mixed Logit model, and policy implications.

1. Introduction

The aim of this paper is to analyse the probability of a visitor to the Venice Visual arts Biennale, subscribing to an art review, thus showing by this habit that he/she is an art addict. With this aim we adopted a Bayesian mixed logit model to take into account the possible heterogeneity of the visitors. The motivation for the present research is based on the following issues. First, in the growing service oriented economy observed in developing countries, culture is a major economic field, usually characterised by some type of addition to cultural issues, (Becker and Murphy, 1988). This addiction is in separate clusters, with some specialised in music, other in paintings, while others focus on architecture, and so on. In this context, it is important for cultural policy purposes to understand the dynamics underlying the cultural preferences, (Stigler and Becker, 1977). As the preferences for cultural issues appear in groups, we may observe some combinations for the Biennale visitors, by museum visits, subscribing to art reviews, visiting other exhibitions, etc. Therefore, in order to analyse these characteristics of preferences according to cultural issues, we assume that subscribing to an art review is a main characteristic for a visual arts addicted individual at a European level, (Brito and Barros, 2005). Secondly, the Biennale of Venice is the oldest and one of the major European art exhibitions attracting visitors from all the world, and for this reason it is a suitable venue to analyse generic characteristics such as art addiction. Finally, the results of such research may be used to compare cultural behaviours at a European level.

With the present paper we analyse art addiction among visitors to the Venice Biennale, using a mixed logit, which allows heterogeneity in the estimated coefficients, enabling us to
propose a policy that takes the identified heterogeneity into account. The model permits the identification of significant statistical variables which explain the variation in the probability that a visitor subscribes to an art review. The value of such research is that it could contribute to policy formulation in identifying the characteristics of art addicted people at a European and American level between art consumers. If one knew the characteristics identifying certain habits, one could then improve resource allocation in managing such preferences.

In econometric models there are variables that are important but exhibit a low variation along the sample. Moreover, this low variation may be organised in clusters. One procedure to use these variables in regression models is to decompose the variable by clusters. See, for example, the decomposition of income adopted by Nicolau and Más (2005). In this case, we obtain a parameter for each cluster. An alternative way to handle this problem is to account for the pattern of similarity and dissimilarity among the decision alternatives, the procedure adopted by the Mixed logit model, (Train, 2003). In this case we obtain a single parameter for the variable, but if this parameter is random due to unobservable heterogeneity, it signifies that we allow for individuals within the sample population to have different parameter values. This procedure is the most efficient in cases of small samples, since the sample span will not allow the decomposition of the variable. The goal is to understand the behavioural process that leads to the probability of a visitor to the Venice Visual arts Biennale subscribing to an art review, revealing by this habit that he/she is an art addict. In a causal perspective there are factors that collectively determine or cause this choice. Some of these factors are observed and some are not. Among the observed variables, some are random, e.g. varying along the sample in a random way and depend on the non-observed characteristics. The mixed logit overcomes the challenge to pick up the right segmentation criteria and the cut-offs whenever we decompose the data, (Nicolau and Más,
2005). The mixed logit estimates individual preferences by deriving within the sample individual's distribution which is based on their known choices. The conditional density is estimated by simulation allowing for different distributions of the error term; see Hensher, Rose and Greene (2005) for details.

The advantage of the Mixed Logit over alternative models lies in two improvements. Firstly, it allows for the error term to combine different statistical distributions, which is an improvement relative to alternative specifications that rely on one specific distribution. Secondly, it allows for random taste variation parameters (parameters that describe characteristics that are not linked to observed characteristics, whenever the traditional logit allows for taste variation related to observed characteristics).

The mixed logit is considered to be the most promising state of the art discrete choice model currently available to analyse questionnaire data, Hensher and Greene (2003). This model is currently being applied in different fields, such as example tourism, (Correia, Barros and Silvestre, 2006), terrorism, (Barros and Proença, 2005), Kim, Lee and Koh (2005) on telecommunications, agriculture, (Alfnes, 2004), transportation, (Jones and Hensher, 2004), (Bath, 1996), (Brownstone and Train, 1999), (Brownstone et al, 2000), recreation, (Train, 1998), energy, (Revelt and Train, 1998) and marketing, (Bonnet and Simioni, 2001). So far Morey and Rossman (2003) have applied this model to culture economics.

Research on culture has adopted a variety of models Bishop and Brand (2003), Collins, Fernández-Blanco and Prieto-Rodrigues (2008), Divisekera, S. and Deegan, J. (2008) and Cuccia and Cellini (2007), with the present research we contribute to this research.

This paper therefore expands previous research on culture, adopting this novel approach, the mixed logit model, to analyse the probability of a visitor to the Venice Biennale of subscribing to
an art review. A thorough survey of state choice methods and applications can be found in Louviere et al. (2000) and Hensher et al. (2005). This paper is organised as follows: in the second section we present the literary framework, while the third section concentrates on the theoretical framework. The fourth section defines the empirical framework, and the final section summarises the results of the research.

2. Literature Review

Since the beginning (Baumol and Bowen, 1965) the analysis of demand for arts has been a central focus in cultural economics research, but the cultivation of taste theory (Stigler and Becker, 1977; Becker and Murphy, 1988) has give it a new stimulus and today it is therefore an established research topic in cultural economics, (Lévy-Garboua and Montmarquette, 1996; Brito and Barros, 2005) that it has been especially applied on performing arts and movie industry. In these fields, studies on demand can be classified into two groups (Corning and Levy, 2002): papers based on surveys which define attendant profiles; and econometric studies which evaluate the main demand function parameters such us price and income elasticities.

The later group began with the classic Moore’s (1966) paper on Broadway theatres demand, and today we can find more than forty different researches on performing arts (see Seaman, 2006). The former group includes descriptive approaches (as Baumol and Bowen, 1966 or Throsby and Withers, 1979, for instance) and demand equations estimated using questionnaire data (i. e. Lévy-Garboua and Montmarquette, 1996; Prieto and Fernández Blanco, 2000). The present paper is based on this last tradition. We follow Morey and Rossman (2003) estimating a demand model with a logit model with random parameters, also known as logit mixed logit. This
procedure is just well known in transport, environmental or health economics and recently it has begun to produce results on cultural economics (Huybers and Bennet, 2000; Maddison and Foster, 2003; Apostolakis and Jaffri, 2005; and Snowball and Willis (2006).

3. Theoretical Framework

Considering the visitors to the Venice Biennale, the main goal is to determine the probability of a visitor subscribing to an art review given some given characteristics. Let \( x_{i,j} \) be the variable that measures the \( j \)-th characteristic on the \( i \)-th visitor and \( x_i \) the vector whose components are \( x_{i,j} \). Let \( y_i \) a binary random variable that assumes value 1 if the \( i \)-th visitor declares he/she subscribes to an art review, and \( y=0 \) if not. The aimed probability is \( P(y_i=1|x_i) \).

Models to determine the probability of an event given a set of variables, \( x_i \), can be derived based on a latent variable, \( y_i^* \), that is not observed and verifies \( y_i^* = \beta' x_i + \varepsilon_i \), where \( \beta \) is a vector of unknown parameters, and \( \varepsilon_i \) is an unobserved random variable allowing that an individual with the same characteristics \( x_i \) might have different outcomes. To use the general framework of binary dependent models, let us simply suppose that \( y_i = 1 \) if \( y_i^* > 0 \) and \( y_i = 0 \) otherwise. Then \( P(y_i = 1|x_i) = P(\varepsilon_i > -\beta' x_i) \) and the desired probability depends on the statistical assumptions about \( \varepsilon_i \). When \( \varepsilon_i \) is independent and identically distributed as extreme value type I the above probability is given by the highly popular logit model,

\[
P(y_i = 1|x_i) = P(\beta, x_i) = \frac{e^{\beta' x_i}}{1 + e^{\beta' x_i}}
\]

(1)
McFadden (1974), Ben-Akiva and Lerman (1985) and Train (1986) used the logit model to relate the probability of making a choice to a set of variables reflecting decision-maker preferences.

In most applications a better specification for the latent variable is \( y_i^* = \beta' x_i + \nu_i + \epsilon_i \)
where \( \nu_i \) is a random variable that takes into account the unobserved heterogeneity among individuals, with zero mean and possibly heteroskedasticity with distribution that frequently depends on the explanatory variables and underlying parameters. In our case, it represents characteristics that influence the probability that an individual will subscribe to an art review, and are not measured or observed, or measurement errors in the variables. Unobserved heterogeneity has been subject of concern and analysis in many recent works as Chesher and Santos Silva (2002) and McFadden and Train (2000). It happens to be frequent in the behaviour of individuals and neglecting it is likely to lead to inconsistent parameter estimates or more importantly, inconsistent fitted choice probabilities.

In this work we have adopted the random coefficients logit model or mixed logit model of McFadden and Train (2000). The model needs sophisticated calculations and some assumptions on the distribution of \( \nu_i \) and consistently estimates the parameters and the choice probabilities provided the distributional assumptions are correctly stated.

3.1. Hypothesis

Let us now consider the Biennale visitors who declare that they subscribe to an art review. This declaration is based on the utility the Biennale tourist receives from subscribing to the art review compared with the utility received from not subscribing to the art review. This utility is based on the reputation of the Biennale as a cultural tourist destination, (Shapiro, 1983)
and the perception of the respondent, formed during the visit, (Fishbein and Ajzen, 1980). This hypothesis has been tested in culture (Morey and Rossman, 2003) and allows the definition of the following hypothesis:

**Hypothesis 1:** The Venice Biennale visitors who declare they subscribe to an art review are those who can be considered art addicts, because they consume a group of art products and services. Art addiction is the intense consumption of art in its different forms. This signifies that the addicted visitor will be characterised by the consumption of a group of cultural products such as visual arts, including subscribing to an art review, (Brito and Barros, 2005). Addiction explains why people feel the need to visit the Biennale, which is usually integrated in their vacations and the need to explore beyond the known, together with the motivation to broaden cultural knowledge, (Thompson et al., 2002).

**Hypothesis 2:** The Biennale of Venice visitors who declare that they subscribe to an art review are those who are older, with more education. This is a traditional hypothesis in culture, where education increases with income and learning comes with age, (Hay and McConnel, 1979); (Miller and Hay, 1981).

**Hypothesis 3:** There are no distinguishable characteristics among different nationalities attending the Venice Biennale visitors who declare that they subscribe to an art review. This is an intuitive hypothesis based on the homogeneity of western cultural traditions.
Hypothesis 4: Contextual variables defined by the Biennale exposition affect the individual perceptions and assessment of the visitor, resulting in either a positive or negative evaluation of the visit.

In order to test these hypotheses, we used a mixed logit representation which assumes that the probability of subscribing to an art review can be described by a cumulative logit-probability function of the exogenous variables $X_i$, $\text{Prob (subscribe/type)}$:

On the basis of this definition, we estimate the above-mentioned probability for the subscriber $i$ as,

$$
\Pr(Subs_i | v_i) = \int_{-\infty}^{\infty} P(\beta, v_i) N(\beta, \mu_3, \sigma_3) \, d\beta
$$

(5)

Where $N(\bullet)$ is the normal distribution, and

$$
v_i = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Education} + \beta_3 \text{Age} + \beta_4 \text{Profession} + \beta_5 \text{Italy} + \beta_6 \text{Germany} +
+ \beta_7 \text{British} + \beta_8 \text{France} + \beta_9 \text{Spain} + \beta_{10} \text{American} + \beta_{11} \text{Museum} + \beta_{12} \text{Exhibition} + \beta_{13} \text{Space1}
+ \beta_{14} \text{Help1} + \beta_{15} \text{Temperature1} + \beta_{16} \text{Easy} + \beta_{17} \text{Clean} + \beta_{18} \text{Illustration} + \beta_{19} \text{Space2} + \beta_{20} \text{Help2}
+ \beta_{21} \text{Temperature2} + \beta_{22} \text{Book} + \beta_{23} \text{Ticket} + \beta_{24} \text{Garden} + \epsilon_i
$$

(6)

We chose the variables from the questionnaire given to this population based on the literature review. We measure $v_i$ by the probability that the visitor declares that he will subscribe to an art review (Yes = 1, No = 0) and measure $X_i$ as observed characteristics. Firstly, we considered individual characteristics: (i) Gender, to analyse the role played by gender in art addiction. Gender is considered an important factor in cultural tourism decisions and may have impact on
cultural consumption, (Nicolau and Más, 2005; Heilbrun and Gray, 1997); (ii) Education, to analyse the role played by education in this context (Hay and McConnel, 1979) and as a determining-taste and specific capital consumption variable (Stigler and Becker, 1977; Seaman, 2006); (iii) Profession, to analyse the role played by the professions in cultural addiction. Professions are important in tourism decisions and may have an impact on cultural consumption, (Nicolau and Más, 2005); (iv) Age, because together with education they are the cornerstones in habit formation and different ages could determine different ways of perceiving the destination (Hay and McConnel 1979; Miller and Hay 1981) and may also affect consumption of cultural reviews.

Secondly, the national characteristics of the respondents are considered, since they may have an impact on cultural consumption due to different cultural traditions: (v) the Country of origin, this is a control variable to take into accounts the different cultural traditions and tourism preferences for the Biennale. Third, the consumption of other cultural products is considered, to investigate complementarities among it, since it is a characteristic that defines addition to cultural products: (vi) Museum, to know the average number of times the individual in question visits a museum, (Sanz, Herrero and Bedate, 2003;, (Kirchberg, 1998); (vii) Exhibition, to know the average number of times the interviewed individual visits another exhibition. Finally, contextual variables are considered to investigate their role in cultural consumption, and to make it possible to develop managerial policies relative to them. We distinguish among (viii) Contextual variables capturing quality perception of the visit to Biennale exhibition: illumination, adequate space to admire works on display, helpful personnel, temperature, easy to reach and cleanliness; and (ix) Contextual variables that capture the assessment of the conditions of the visit to the Biennale, such as helpful personnel, personnel preparation, temperature, book
shop, ticket office. (x) Finally, we include the declaration that the respondent visits the Biennale Garden.

4. The Research

4.1 The Empirical Study

The empirical study was carried out by means of the previously-mentioned questionnaire, which was presented to a random sample of cultural tourists, with the central aim of determining the extent to which he was an art addict based on its cultural practices.

The data was gathered by means of two methods: an individual interview with help of a laptop computer (Mobile Computer-Assisted Personal Interviewing) that was used for the Italian public and for the operator-assisted self-compilation by foreign visitors. In both cases, the selected subjects were interviewed having completed the visit of the exhibition.

The questionnaires were collected from July 15 to September 10, 2003. The number of visitors attending the Biennale in the reference period for the survey was estimated at 60,824 persons (44% male and 56% female), of which 1,635 were selected at random and interviewed. Considering that 6.7% of the questionnaires were discarded in the processing phase due to their being incomplete or due to compilation mistakes, the sample used for the statistical analysis was made up of 1,525 interviews.
4.2 The Questionnaire

The main purpose of the research performed in the Venice Arsenal, one of the main exhibition venues of the Venice Biennale, was to analyse some specific aspects of extended exhibitions. In order to achieve this aim, a random survey was performed by means of a structured interview to gather information on those who visit the Biennial, on their expectations, on their level of satisfaction in reference to the exhibition, (Dillman, 1978). The questionnaire was made up of 27 questions gathering information in five different fields.

The interviewers asked the Biennale visitors to complete a standard questionnaire, including questions concerning socio-economics, means of transport, motivations and destinations. The questionnaire construct adopted asked a set of variables most frequently quoted in literature (Siricaya, Mclellan and Uysaal, 1996; Iso-Ahola and Mannel, 1987; Fodness, 1994; Shoemaker, 1989; Mitchel and Carson, 1989, Thompson et al., 2002; Dillman, 1978).

Table 1 shows the variables observed that assume statistical significance in this model and were therefore retained for analysis, the proposed questions and the corresponding scales.

Table 1 - Characterisation of the variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subs</td>
<td>Dummy variable which is 1 if the respondent subscribes an art review and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.716</td>
<td>0.451</td>
</tr>
<tr>
<td>Gender</td>
<td>Dummy variable which is one if the respondent is male and zero if it is female</td>
<td>0</td>
<td>1</td>
<td>0.405</td>
<td>0.491</td>
</tr>
<tr>
<td>Education</td>
<td>The education level of the respondent which is 1-primary level, 2-secondary level, 3-university level and 4-master and PhD.</td>
<td>1</td>
<td>4</td>
<td>3.004</td>
<td>0.801</td>
</tr>
<tr>
<td>Profession</td>
<td>Classification of the profession according to Italian Ministry of Employment</td>
<td>1</td>
<td>44</td>
<td>19.531</td>
<td>12.070</td>
</tr>
</tbody>
</table>

2 The Biennal uses three different venues: the Giardini di Sant’Elena, its historical venue, Museo Correr, which is part of St. Mark’s Square’s civic museum network and the Arsenal, a decommissioned industrial area that for the last three editions has been rented out to the Biennal and allocated to contemporary art exhibitions.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>The declared age of the respondent</td>
<td>3</td>
<td>78</td>
<td>36.546</td>
</tr>
<tr>
<td>Italian</td>
<td>Dummy variable which is one for Italians and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.359</td>
</tr>
<tr>
<td>German</td>
<td>Dummy variable which is one for Germans and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.147</td>
</tr>
<tr>
<td>British</td>
<td>Dummy variable which is one for English and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.0493</td>
</tr>
<tr>
<td>French</td>
<td>Dummy variable which is one for French and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.052</td>
</tr>
<tr>
<td>Spain</td>
<td>Dummy variable which is one for Spanish and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.011</td>
</tr>
<tr>
<td>American</td>
<td>Dummy variable which is one for Americans and zero elsewhere</td>
<td>0</td>
<td>1</td>
<td>0.0311</td>
</tr>
<tr>
<td>Museum</td>
<td>The number of times in the last year the respondent declares he/she visited a museum</td>
<td>0</td>
<td>365</td>
<td>10.891</td>
</tr>
<tr>
<td>Exhibition</td>
<td>The number of times in the last year the respondent declares he/she visited an exhibition</td>
<td>0</td>
<td>300</td>
<td>14.031</td>
</tr>
<tr>
<td>Space1</td>
<td>Adequate space to admire the works on display (Expectation)</td>
<td>1</td>
<td>5</td>
<td>4.254</td>
</tr>
<tr>
<td>Help1</td>
<td>Helpful personal (Expectation)</td>
<td>1</td>
<td>5</td>
<td>4.301</td>
</tr>
<tr>
<td>Temperature1</td>
<td>Temperature (Expectation)</td>
<td>1</td>
<td>5</td>
<td>3.388</td>
</tr>
<tr>
<td>Easy</td>
<td>Easy to reach (Expectation)</td>
<td>1</td>
<td>5</td>
<td>3.250</td>
</tr>
<tr>
<td>Clean</td>
<td>Cleanliness (Expectation)</td>
<td>1</td>
<td>5</td>
<td>4.037</td>
</tr>
<tr>
<td>Illumination</td>
<td>Illumination (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.236</td>
</tr>
<tr>
<td>Space2</td>
<td>Adequate space to admire the works on display (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.869</td>
</tr>
<tr>
<td>Help2</td>
<td>Helpful personal (Assessments)</td>
<td>1</td>
<td>5</td>
<td>4.086</td>
</tr>
<tr>
<td>Preparation</td>
<td>Preparation of personal (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.784</td>
</tr>
<tr>
<td>Temperature2</td>
<td>Temperature (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.6941</td>
</tr>
<tr>
<td>Book</td>
<td>Book shop (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.317</td>
</tr>
<tr>
<td>Ticket</td>
<td>Ticket office (Assessments)</td>
<td>1</td>
<td>5</td>
<td>3.289</td>
</tr>
<tr>
<td>Garden</td>
<td>Declares he visited exhibition at Biennale Giardini</td>
<td>1</td>
<td>5</td>
<td>2.9551</td>
</tr>
</tbody>
</table>

It can be verified that the variables include continuous variables (education, profession, museums and exhibition), dummy variables (nationalities and gender) and likert type variables ranging from 1 to 5.

### 4.3 The Results
To estimate the mixed logit model, we used a simulator for the mixed logit on the Gauss programming language, available on Kenneth Train’s home page (http://elsa.berkeley.edu/~train/Ps.html). Other results were obtained with TSP. We present a standard logit model and the Bayesian mixed logit model for comparative purposes. In this, one can adopt the same procedure as in Train (2003) for Bayesian estimation. The only change is that one should calculate the probability of the individual’s sequence of rankings, which is used in the Metropolis-Hasting (M-H) algorithm, instead of the probability based on the response of the most preferred choice as in Train (2003).

Focusing on the adequacy of the standard logit model, we implemented the RESET test. The result gives evidence of mis-specification of the logit model. This may be due to the presence of unobserved heterogeneity, depending on the aforementioned explanatory variables. We applied the HAL test of Chesher and Santos-Silva (2002), using likelihood ratio procedures to test against this type of heterogeneity. First, we considered that it was dependent on all of the explanatory variables. Next, we applied a classic selection procedure. The final results can be seen in Table 2.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Logit Model Homogenous effects</th>
<th>Logit Model Mixed Logit (RML) Homogenous effects</th>
<th>Mixed Logit (RML) Random effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>t-stat</td>
<td>Estimate</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.621</td>
<td>-1.148</td>
<td>-1.169</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.403</td>
<td>**-2.235</td>
<td>-0.288</td>
</tr>
<tr>
<td>Education</td>
<td>0.439</td>
<td>1.071</td>
<td>0.313</td>
</tr>
<tr>
<td>Profession</td>
<td>0.009</td>
<td>1.295</td>
<td>0.007</td>
</tr>
<tr>
<td>Factor</td>
<td>Coef</td>
<td>Std. Err</td>
<td>z</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>Age</td>
<td>0.014</td>
<td>0.010</td>
<td><strong>1.848</strong></td>
</tr>
<tr>
<td>Italian</td>
<td>-1.360</td>
<td>0.972</td>
<td><strong>-5.651</strong></td>
</tr>
<tr>
<td>German</td>
<td>-0.141</td>
<td>0.062</td>
<td>-0.215</td>
</tr>
<tr>
<td>British</td>
<td>-0.190</td>
<td>0.1405</td>
<td>-0.435</td>
</tr>
<tr>
<td>French</td>
<td>-0.086</td>
<td>0.062</td>
<td>-0.215</td>
</tr>
<tr>
<td>Spain</td>
<td>0.912</td>
<td>0.635</td>
<td>1.457</td>
</tr>
<tr>
<td>American</td>
<td>-0.424</td>
<td>0.301</td>
<td>-0.679</td>
</tr>
<tr>
<td>Museum</td>
<td>0.038</td>
<td>0.027</td>
<td><strong>2.106</strong></td>
</tr>
<tr>
<td>Exhibition</td>
<td>0.089</td>
<td>0.063</td>
<td><strong>4.794</strong></td>
</tr>
<tr>
<td>Space1</td>
<td>0.108</td>
<td>0.077</td>
<td>*1.713</td>
</tr>
<tr>
<td>Help1</td>
<td>0.205</td>
<td>0.147</td>
<td><strong>3.161</strong></td>
</tr>
<tr>
<td>Temperature1</td>
<td>0.146</td>
<td>0.104</td>
<td><strong>2.977</strong></td>
</tr>
<tr>
<td>Easy</td>
<td>0.150</td>
<td>0.108</td>
<td><strong>3.323</strong></td>
</tr>
<tr>
<td>Clean</td>
<td>-0.198</td>
<td>-0.141</td>
<td><strong>-2.036</strong></td>
</tr>
<tr>
<td>Illumination</td>
<td>0.158</td>
<td>0.109</td>
<td><strong>3.042</strong></td>
</tr>
<tr>
<td>Space2</td>
<td>-0.133</td>
<td>0.095</td>
<td><strong>-2.099</strong></td>
</tr>
<tr>
<td>Help2</td>
<td>-0.138</td>
<td>-0.098</td>
<td><strong>-2.64</strong></td>
</tr>
<tr>
<td>Preparation</td>
<td>-0.173</td>
<td>-0.123</td>
<td><strong>-3.258</strong></td>
</tr>
<tr>
<td>Temperature2</td>
<td>-0.199</td>
<td>-0.143</td>
<td><strong>-3.258</strong></td>
</tr>
<tr>
<td>Book</td>
<td>0.221</td>
<td>0.158</td>
<td><strong>3.588</strong></td>
</tr>
<tr>
<td>Ticket</td>
<td>-0.083</td>
<td>-0.059</td>
<td><strong>-2.048</strong></td>
</tr>
<tr>
<td>Garden</td>
<td>0.151</td>
<td>0.108</td>
<td><strong>3.652</strong></td>
</tr>
</tbody>
</table>

**Observations:** 1540

LogLikelihood statistic:

Spec: 

**RESET on stand. Logit**
-2.579, p-val 0.011

**HAL on standard Logit**
20.379, p-val 0.002
LR: standard vs 39.22 0.003

Observations: Robust standard errors.
RESET: Detects misspecification in the logit model and was performed with \( \hat{\beta}X^2 \);
HAL: Detects evidence of heterogeneity in the logit model depending on Age and Italians
LR: Likelihood ratio test
** means statistical significant at 5%; *** means statistical significant at 1%.* mean statistical significant at 10%

The reference group are those respondents who do not subscribe art reviews. All variables are homogenous with the exception of two (age and Italia. For the mixed logit framework, the probability of subscribing to an art review increases with personal characteristics such as gender female, education level and profession classification, displaying a traditional profile of art addiction. Moreover, it also increases with cultural preferences, when the respondent also visits a museum and visits other exhibitions. Furthermore, the probability increases with expectations regarding space, help and temperature. In addition, it decreases with the assessment of the space, help and temperature. It also increases with the bookshop, the easy arrival to the Biennale, but decreases with ticket and cleanliness. Finally, it increases when the individual visits the garden. Age and Italian are random parameters. The fact that a parameter is random signifies that the effect of this variable is on average positive or negative, but it has a widespread variance, so that it varies greatly along the sample. In this condition, we conclude that the probability of subscribing to a review increases with age, but in a heterogeneous way. The same interpretation applies to the probability of Italians who visit the Biennale subscribing to an art review.
Comparing the standard logit with the respective mixed logit by means of an LR test, we obtain a test statistic with \( p \)-values equal to 0.003, indicating that the mixed logit is the more appropriate specification.

### 4.4. Discussion

The results confirm that the Biennale is in demand by individuals characterised as being male in 40\%, with an average university degree, with an average age of 36, and higher-ranking professions in the Illy classification. Based on these individuals’ characteristics, it can be asserted that the Biennale visitor is a middle and upper middle class individual, addicted to arts, since he/she declares to have visited an average of 10 museums during the last year and an average of 14 art exhibitions. Regarding nationalities, the Italians are the most representative, followed by the Germans, the French, the British, the Americans and the Spanish. Regarding the characteristics of the Biennale exposition, the individual visitor has positive expectations, but sometimes a negative assessment. Finally, a large number of visitors (2 out of 3) declare they have visited the Biennale exhibition at the Giardini.

Our results show that the probability of subscribing to an art review is related to individual socio-economic characteristics and exhibition attributes.

Related to the hypothesis, based on the estimated model we accept hypothesis 1, because the individual declares he/she visits museums and exhibitions as well as subscribing to a review. This consumption group defines an art addicted person. As these variables are of statistical significance, they support the hypothesis statistically.

We also accept hypothesis 2 since the individuals who declare they subscribe to an art review are female, educated with a university degree, middle-aged and with a high income. However, age is random, signifying that the subscription of an art review
is not homogenous by age groups, but rather varies along the age sample.

We partially accept hypothesis 3 because the nationality parameters are all insignificant with the exception of Italian, which is random, but since it is a home effect, we do not reject the hypothesis.

We accept hypothesis 4, because the individuals who subscribe to an art review form perceptions on the contextual characteristics of the visit, which are statistically significant. Moreover, these individuals also make an assessment of the contextual characteristics of the visit.

The findings presented in this study also have the potential to redirect marketing strategy, because model when integrating different kinds of variables, this model allows the managers to know, what the socio-economic characteristics of the individuals who visit the Biennale and subscribe to an art review are. Naturally, any policy tailored by age has to be defined by clusters, based on the heterogeneity of this estimated parameter. Moreover, the contradiction between perception and assessment is a field for the Biennale managers to act appropriately.

5. Conclusions, Limitations and Extensions of the Research

This study has important managerial implications for the planning of the Venice Biennale. The main one is the definition of the average visitor as an art addict. These individuals are on average more female than male who, as well as visiting the Biennale, also visit museums and other exhibitions. This behavioural pattern has implications for the management of the Biennale, which is that art consumption is made in groups, and therefore multiple exhibitions should be on display in the city during the Biennale. Moreover, the Venice museums should adopt an active display
policy during the Biennale; to profit from the consumption of multiple art products by the art addicted visitors.

The second important implication shows that there no statistical significant nationality effects on the subscription of an art review. This relationship is negative but statistically insignificant. It is negative and significant for Italians, but it is also random, signifying that the sample is random, and therefore on average the Italians that visit the Biennale do not subscribe to art reviews, although some of them do. The third one relates to the perceptions and assessments of the exhibition.

In the light of the extensive literature on cultural research, it is useful to consider the potential contributions of the current research. The first contribution is the estimation of a mixed logit to analyse questionnaire data. Past studies relied on the traditional logit or probit model, or used a mixed logit model applied to American cultural issues, Morley and Rossman (2003).

One major limitation affecting this study concerns the data. The data was conceived for characterising the Venice Biennale visitors, Bernardi, Pizzi and Vecco (2004). The research issue analysed in this paper was considered a minor issue in the data gathering process. Therefore some variables obtained were not statistically significant and were therefore deleted from the analysis.

As a general conclusion we verify that the mixed logit outperforms the logit model in estimating the data, based on the statistical tests performed in table 2. Therefore, Venice Biennale visitors have a probability of subscribing to an art review that increases based on some characteristics such as gender, education, profession and age. However, age is heterogeneous and therefore a policy to attract art adductors has to take this characteristic of the sample into consideration and to define different policies for the different segments of the visitors’ age. No common policy can achieve
all clusters. Moreover, the probability of subscribing to an art review decreases based on the assessment of the visit. For the homogenous variables a single policy can be adopted to attain the objective.

We did not identity variables which can negatively affect the subscription to an art review, because the “apparently” negative parameters can be explained by the fact that an added consumer subscribes to an art review influences the assessment on the services provided by the Biennale.

This study confirms the law of increasing marginal utility concerning the cultural consumption: due to positive addiction, (Becker and Murphy, 1989) consumption requires more consumption, which can implicate a consumption characterised by a higher intensity, such as the need for more documentation through an art review.

These results can not be used to compare cultural behaviour at a European level because we did not identify important statistically nationality variables influencing the subscription to an art review.

REFERENCES


the Mississippi Flyway American Journal of Agricultural Economics, 63: 677-684.


