Using Choice Experiments to design a "pure" cultural asset matching heterogeneous preferences

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Abstract

Economists such as Baumol (2011) have pointed out that many cultural activities and facilities hardly exist without public subsidies. However, in a context of budget cuts, local public authorities must justify spending projects intended for residents. This legitimisation of public cultural projects is all the more likely to occur if the heterogeneous preferences of citizens are taken into account. These preferences are studied in this article through the use of the method of Choice Experiments for the implementation of a cultural asset project intended to satisfy a local population. For this purpose, we apply the latter to the valuation of a municipal music school project displaying different characteristics. We show that the monetary values of the music school characteristics, estimated by Random Parameters Logit with interactions and Latent Class models, with taking into account non-attendance, depend on the proximity of individuals to culture. The results also indicate that it may be in the interest of authorities to offer a music school with a collective dimension beyond the interests of the only future users.

Keywords: Choice Experiments, Random Parameters Logit Model, Latent Class Model, Cultural policy

1 Introduction

The current context of tight local finances is not favourable to the financing of culture: the implementation by authorities of a new cultural project has to coincide as far as possible with the preferences of their visitors or users. It has also to coincide with those of citizens that are potentially required to finance part of the construction and operating of this cultural project via their local taxes. In particular, it is sometimes difficult to defend the public financing of certain cultural activities: not only this public funding generates a questionable redistribution of income from non-users to users (Towse, 2011) but above all, as it is sometimes pointed out about the arts, "*their audiences are typically composed of individuals whose incomes, wealth and education are well above of those of the population as the whole"* leading to *"a reversal of "Robin of Hood" practice, taking from the poor to give to the rich*" (Baumol, 2011). However, even if this issue of public funding could be partially bypassed via for instance a Ramsey-Boiteux pricing, all the citizens remain *a priori* concerned with the local public cultural policy. The appreciation of their possibly heterogeneous preferences, whether or not they are potential users and/or taxpayers, becomes even more prevalent when the public cultural asset (or activity) targets specifically the local population without having a tourist vocation[1].

The respect for individual's preferences is part of a more general problem of valuation of public cultural assets. Since they do not place within a competitive framework, administered prices (when they exist) do not allow to know the value that inhabitants set on that cultural asset. Various non-market valuation methods can then be used to measure this value. However, in order to measure the relative importance of various characteristics of a cultural asset, only the Hedonic Price Method in line with works applied to market for painting (e.g. Chanel et al., 1996; Renneboog and Van Houtte, 2002) and the Choice Experiments (CE) Method are adapted. Indeed, based on the Lancastrian demand theory (Lancaster, 1966), these methods allow in particular to calculate the marginal willingness to pay that individuals assign to the characteristics of the valuated good. Moreover, in view of the monetary valuation of a future project, only hypothetical methods have sufficient flexibility without being constrained by the existing. Therefore, it appears that the CE method is suited to the case studied in this article, namely the creation of a municipal music school. The aim of this article is thus to evaluate by this method the value that individuals assign to the various characteristics of a local "pure" cultural asset, which we define here as a cultural asset devoid of any tourist and/or aesthetic attraction and that is intended only for the local population, characteristics of which are *a priori*

[1] In contrast, the implementation of a cultural equipment having such a tourist destination can achieve a consensus within the population: beyond the differences of cultural tastes, a tourist cultural project can generate a common interest associated with the increasing of economic activity and employment.

perfectly identifiable. This paper is organized as follows: in section 2, we show that there may be a methodological problem when CE is applied to a cultural framework. Section 3 presents the theoretical econometric specification models. Section 4 describes the survey and the data. Econometric results and welfare estimates are presented in Section 5. Concluding remarks are finally given in Section 6.

2 Choice Experiments and cultural asset: is there a methodological problem connected with sampling?

Remind that the CE method consists in submitting to each respondent a set of choices between several alternative programs which are decomposed into different attributes with levels differing from one program to another. The use of CE method in a cultural context knows an important development since the mid-2000s (e.g. Willis and Snowball, 2009). However, most of articles using CE applied to culture relate to assets or activities that have not only a cultural dimension, but also, more or less explicitly, a tourist dimension (eg. British Museum in London (Jaffry and Apostolakis, 2011) and the Galleria Borghese Museum in Rome (Mazzanti, 2003)). This double cultural and tourist dimension raises an issue from a methodological point of view. Indeed, there are *de facto* two types of very distinct respondents, namely residents and tourists. These two populations are *a priori* heterogeneous regarding their socioeconomic characteristics and their cultural tastes. The procedure consisting in distinguishing in econometric analyses these two intrinsically different populations via two sub-samples (e.g. Tuan and Navrud, 2007) is not sufficient to eliminate this problem. Indeed, in the case of a sample concerning the only tourists, the question of the representativeness seems hard to resolve: considering that surveys are most of the time carried out on sites (e.g. Grisolia and Willis, 2011, 2012) or in hotels located around sites (e.g. Apostolakis and Jaffry, 2005) leading to an on-site sampling bias and given that the precise characteristics of the parent population of these tourists are generally unknown, what is the statistical significance of the Willingness-To-Pay (WTP) obtained ? Moreover, if the results of econometric estimates indicate that the choice of programs is related to the characteristics of these programs but is also related to certain characteristics of the individuals surveyed (e.g. income, age, gender etc.), the values obtained are only valid for the sample and cannot be used for recommendations in terms of cultural policies. In addition, even if it is possible to obtain the characteristics of all the visitors to the surveyed cultural site (e.g. Jaffry and Apostolakis, 2011), this knowledge does not solve the issue of selection bias: indeed, it would also be necessary to know the characteristics of potential visitors who do not currently attend this site, for example because of one or more current site characteristics (e.g. the level of congestion) that dissuade them from attending. These current non-visitors could potentially attend the site according to the hypothetical changes proposed by the CE and should therefore be included in the parent

population. In the case of a sample focusing on local residents, the problem is different: in fact, it is possible to obtain a representative sample of the parent population from its known characteristics. However, if it can be assumed that tourists choose programs based on the price and their own cultural or recreational preferences, it may not be the same for some residents: these persons can indeed make choices concerning attributes based on economic reasons: they may select programs with characteristics that allow to maximize the tourist attraction, knowing that these choices can differ from choices based on their only true cultural preferences. Because of this duplicity between cultural and economic rationale, we cannot actually know whether these WTP expressed by residents truly correspond to values associated with their cultural preferences in the strict sense or whether these WTP incorporate other concerns. As a result, there is a risk of over or under-estimation of values assigned to cultural characteristics studied in the framework of the CE. It is for these reasons that we believe that a simple use of such a method is completely relevant only in the context of a "pure" cultural asset with no tourist dimension. Therefore, we have chosen to apply the CE method to the hypothetical creation of a municipal music school (located in Angers[2], France) as this is a typical case of "pure" cultural assets in the sense that it produces flows of music services (i.e. learning and practicing a musical instrument) without any claim in terms of tourist or aesthetic attraction nor in terms of significant economic activity or jobs. Concomitantly, a music school is in general a facility specifically intended for the local population which is generally well known in terms of socioeconomic characteristics, so that it is possible to obtain a representative sample from it. It is indeed a question of being able to generalize to the whole population, the values obtained via econometric estimates, especially if a heterogeneity of cultural preferences from the surveyed individuals is highlighted.

3 Econometric specification

The CE models have their roots in Random Utility Theory (e.g. McFadden, 1974). The Multinomial Logit model (MNL) can be used for choice models but it assumes in particular that all respondents share the same preferences. This is a very strong assumption which may not hold in reality. The Random Parameters Logit (RPL) accounts for the heterogeneity of preferences by allowing model parameters to vary randomly over individuals. Each individual's tastes for an attribute are defined from a specified distribution (for more details, see McFadden and Train, 2000; Hensher and Greene, 2003). However, the simple RPL (i.e. without interactions) (RPL1) is not well-suited to explain the sources of heterogeneity. For example, these sources can be related to socioeconomic characteristics of respondents or to composite

[2] The city of Angers is a city in west-central region of France and medium size (149 000 inhabitants in 2012, the 18th largest city in France). It is representative of a French mid-sized city.

attitudinal variables that are able to measure the heterogeneity in the means of the random parameters. Indeed, from a policy perspective, it is interesting not only to highlight the unobserved heterogeneity but also to explain a systematic heterogeneity (observed heterogeneity), via a Random Parameters Logit with interactions (RPL2). Grisolia and Willis (2011) use this method to take into account the heterogeneity of preferences of individuals attending the theatres of Newcastle (United Kingdom). In order to do so, they cross the attributes of the cultural asset with the socioeconomic characteristics of respondents (gender, family type, income) as well as with an indicator measuring the cultural capital of the latter. This indicator is obtained from questions about the frequency of visits to various theatres, the number of books read per year and cinema attendance. Each respondent is then identified as belonging either to a low cultural level group or to a high cultural level group. Jaffry and Apostolakis (2011) also use this method to evaluate individual preference for future managerial initiatives at the British Museum (London). The characteristics used to measure a possible systematic heterogeneity linked to individuals are their gender and their museum attendance. They show that individuals might respond differently to the various measures implemented by the museums. Morey and Rosmann (2003) also indicate that the WTP to preserve the 100 outdoors marble monuments in Washington, D.C. varies significantly according to the age and to the ethnicity of the respondents.

Alternatively, in the latent class formulation, parameters heterogeneity across individuals is modelled with a discrete distribution. The Latent Class Model (LCM) assumes that each individual belongs to one class but that class membership is based on segmentation regarding tastes. Individuals do not have the same tastes when they do not belong to the same class and, they have the same tastes when they belong to the same class. This model simultaneously classifies individuals into classes and estimates their utility parameters conditional on class membership (for more details, see for instance Greene and Hensher, 2003). An individual can be assigned to one class depending on his characteristics (e.g. Grisolia and Willis, 2012) or on composite attitudinal variables (see, for example, in the field of environment valuation, Burton and Rigby, 2009). Because of its structure, the LCM is generally considered as a method easier to implement and to understand for decision makers because it allows to identify different classes of willingness to pay defined according to the profile of individuals as well as their respective weights in the surveyed population. Therefore, this classification offers the possibility of designing more efficient policies that reflect this diversity of tastes (Duran et al., 2015). Thus, Grisolia and Willis (2012) use this approach to identify various groups of people attending the theatres of Newcastle according to their socioeconomic characteristics (age, income, educational level) and their theatre attendance (whether or not to attend a theatre more

than 5 times during the previous 12 months and whether or not to attend a Royal Shakespeare Company (RSC) performance during the sample collection period).
These two kinds of specifications (RPL and LCM) will be used to account for possible heterogeneity of individual preferences concerning various attributes associated with a municipal music school.

4 Survey Design , sample and data description

4.1 Survey Design

Within the framework of our CE, the music school is analysed as a cultural asset that produces a flow of services (music learning and music practice) for users throughout the year. This cultural asset is decomposed into six attributes that meet the criteria usually required concerning the implementation of this method[3]. This number corresponds to the high range of what is usually proposed in the literature applied to cultural issues: we find this number in Willis and Snowball (2009) and Duran et al. (2015). It is the result of a trade-off between on one hand the purpose to describe this cultural asset in the most realistic way and on the other hand, the need to develop an operational design, i.e. a design aiming at a high level of statistical efficiency while taking into account the cognitive burden required from each respondent.

Among these six attributes, the monetary attribute (Price) includes 4 levels of annual rate paid by every user of the future music school (200€, 400€, 600€, 800€). The five non-monetary attributes are dichotomous variables, which reflect the presence or absence of a specific service concerning the conditions of music learning and music practice: the possibility or not to choose between group courses and individual courses (Course_choice), the possibility or not to attend courses between 8pm and midnight (Hours), the possibility or not to practice some instruments usually less commonly taught in music schools (Atypical_instruments), the existence or not of a recording studio and of a rehearsal space (Specific_equipment). Thus, these first 4 non-monetary characteristics correspond to services to the user individually. Conversely, the fifth non-monetary characteristic (Promotion_talent) has a collective dimension: it describes the existence or not of an annual organisation by the music school of the detection and the promotion of local talented musicians (music competition, aids for recording, placement in the opening act for a concert) to promote musical creation in the city. This absence of an automatic link between this action towards talented musicians and the enrolment in this music school is therefore seeking a more or less important altruistic or collective inclination from the

[3] These criteria include in particular independence between attributes, objectivity, absence of ambiguity, plausibility, and the absence of impossible combinations.

respondent. This iconoclastic attribute can be so seen as a means of legitimizing with the whole population of the city (particularly the future non-users) the creation of a facility that will have a real collective vocation, not just reserved for the minority fringe of the only future users of this school. The definition and selection of these attributes result from a pre-test on inhabitants of Angers. This pre-test also allowed to test the understanding of the various questions in the questionnaire and to check if the cognitive burden associated with the presence of these six attributes was acceptable. In our design, every respondent has to choose between two programs of 6 attributes and a status quo (i.e. no music school creation) (see Table 1).

Table 1 Example of card shown in the experiment

Attribute	Program A	Program B
Type of courses	**No possibility** to choose between group courses and individual courses (the type of course is imposed according to the instrument)	**Possibility** to choose between group courses and individual courses whatever the instrument
Course schedules	**Possibility** to attend courses between 8pm and midnight	**No possibility** to attend courses between 8pm and midnight
Type of instruments	**Possibility** to practice some instruments usually less commonly taught in music schools	**No possibility** to practice some instruments usually less commonly taught in music schools
Specific equipments offered from 9am to 20pm	**Existence** of a recording studio and of a rehearsal space	**Absence** of specific equipments (classrooms only)
School policy in promoting local musical talents	**Absence** of school policy in promoting local musical talents	**Annual organisation** by the music school of the detection and the promotion of local talented musicians (music competition, aids for recording, placement in the opening act for a concert) to promote musical creation in the city
Annual rate	400€	200€

☐Program A ☐Program B ☐ Neither (no creation of music school)

Given the number of respective levels for each attribute, the full factorial design included $2^5 \times 4$ possible alternatives. To reduce this number, the experimental design developed by SAS software (Kuhfeld, 2010) was used to generate an efficient design including a restriction that prevents dominated pairs and allowing for main effects. Since the number of choices per respondent was still too high, the resulting optimal choice set of 16 choice pairs was divided into 2 blocks of 8 choices in order to reduce the cognitive burden.

4.2 Sample selection

The size and the composition of the sample is also important (see section 2) even if this issue is little addressed theoretically in various articles concerning the CE method. The sample size used in most of the studies is generally guided by practical considerations (time and available resources). However, Louviere, Hensher and Swait (2000) provide a calculation based on the percentage for each alternative. However, this rule requires in particular to know *ex ante* this percentage which is not often the case in CE surveys. Orme (2010) recommends having a sample of at least 300 individuals with a minimum of 200 individuals per group if subgroup analyses are performed. Johnson et al. (2013) indicate that the marginal gains in precision in terms of estimation increase strongly for the samples with a size lower than 150 individuals and they decrease for the samples with a size higher than 300 observations. Moreover, in order that the surveyed population to be representative in terms of gender and in terms of age group of the population of the city Angers over 15 years of age, we have used the quota sampling for both versions of the questionnaire (one per block). Thus, 568 individuals (284 individuals × 2 blocks) were interviewed face to face between May and July 2014.

Each respondent is questioned first about his habits and opinions about culture[4] and his music practice. Various programs concerning a new music school are then presented to each respondent. After making an example's choice, each individual has to make 8 choices consecutively. On the one hand, the example aims to check whether the respondent understands the process. On the other hand, this example is intended to check the consistency of individual choice: indeed, the programs proposed in the example are identical to those of the 7th choice by interchanging their title (A instead of B and *vice versa*). Questions on the heuristic used by respondents for these choices are also asked, allowing to know in particular whether the attributes of the programs have all had an influence on their choices (non-attendance issue). Respondents are finally asked about their socioeconomic characteristics.

4.3 Data description

The observed values of the Chi-square test for the two versions of the questionnaire (0.32 for the first block, 0.05 for the second block) are lower than the theoretical value at the 5% risk level of ($\chi^2(2) = 5.99$): consequently, the data collected are representative in terms of age and gender from the population of the city of Angers over 15 years of age (INSEE, 2011 census of France). Concerning other socioeconomic characteristics, respondents have similar

[4] As a complement to these questions, respondents were questioned about their attendance at sporting events.

characteristics to the population of the city, except an overrepresentation of the socio-occupational category of "Employees"[5] and an under-representation of high-incomes (over 5000 € per month) and of people without qualifications (see Appendix A and Appendix B for the definition and statistics concerning these characteristics). Finally, 11% of respondents report practicing a musical instrument as amateurs in the last 12 months which is close to the national average (12% according to a survey on cultural practices of the French people in 2008) (French Ministry of Culture and Communication, 2008). Respondents are overwhelmingly (90.8%) consistent in their choices. Furthermore, only 2.8% of respondents reported having made their choices at random. Note that people consistently expressing systematically their preferences for the non-creation of the music school ("serial non-participants") represent 30.8% of respondents and 32.4% of consistent respondents that did not respond at random. For respondents not choosing systematically the status quo, 87.5% of them are consistent in their choices. In order to synthesize the information obtained from the survey on the attitudes of respondents towards cultural and sports activities, a Hierarchical Cluster Analysis is carried out to develop a typology[6], based on a Multiple Correspondence Analysis. This strategy makes it possible to create an indicator of proximity to cultural and sports activities that could explain the heterogeneity of choices made by individuals. Our indicator has been built from the level of annual attendance of theatres and dance performances, museums and exhibitions, movies, sporting events, circuses and street performances as well as classical concerts, jazz concerts and contemporary concerts (see Table 2)[7].

Table 2 Various cultural and sporting events attendance

	Never	**Rarely**	**Annually**	**Monthly**
Classical concerts	70.3 %	23.2 %	5.1 %	1.4 %
Jazz concerts and contemporary concerts	39.8 %	37.7 %	19.9 %	2.6 %
Theatres and dance performances	40.1 %	39.6 %	15.5 %	4.8 %
Circuses and street performances	63.9 %	29.4 %	5.6 %	1.1 %
Museums and exhibitions	34.7 %	38.5 %	20.8 %	6.0 %
Movies	12.8 %	23.8 %	42.8 %	20.6 %
Sporting events	39.4 %	30.5 %	20.6 %	9.5 %

[5] The population of France is divided by INSEE (French Institute of Statistics and Economic Studies) into 6 categories of working people (according status, occupation, and skills) and 2 categories of inactive people.

[6] Duran et al. (2015) also used a Hierarchical Cluster Analysis to identify groups of respondents "who showed feelings from sympathy to aversion towards cultural heritage". However, this classification is performed from a Principal Component Analysis, as the respondents' answers were defined on a Likert scale.

[7] The introduction into the Hierarchical Cluster Analysis of questions relating to the music practice leads to a typology of respondents that is less pronounced. Consequently, these questions have not been taken into account in the construction of the indicator, as the practice of music is not discriminating.

This indicator also includes the following questions concerning opinion on the role of culture (see Table 3):

- Culture is essential for the economic development of the city of Angers (Q1)
- Culture is one of the subjects to be taught in school (Q2)
- Culture is a determining factor in my choice to live in the city of Angers (Q3)
- The municipal budget for culture should be maintained despite the current budgetary difficulties (Q4)

Table 3 Opinion of respondents concerning the role of culture

	Don't know	**Agree**	**Disagree**
Culture_Development (Q1)	14.1 %	79.0 %	6.9 %
Culture_Teaching (Q2)	19.9 %	68.3 %	11.8 %
Choice_Housing (Q3)	26.1 %	18.3 %	55.6 %
Budget_Culture (Q4)	30.5 %	53.0 %	16.5 %

Thus, the Hierarchical Cluster Analysis (via the Ward method) allows to obtain 3 groups[8] of respondents with different proximities to cultural and sports activities. Indeed, the first group (38.7% of the sample) corresponds to people who never attend classical concerts, jazz concerts and contemporary concerts, theatre and dance performances, museums and exhibitions, street performances and sporting events. They do not attend or attend rarely movies. These are also respondents who declare not to know or to disagree on the fact that culture is essential for the economic development of the city of Angers, on the fact that culture is one of the subjects to be taught in school or on the fact that municipal budget for culture should be maintained despite the current budgetary difficulties. This group is made up of people who do not know if culture is a key factor in their choice to live in the city of Angers. Thus, it is made up of people who do not attend cultural and sporting events and who are little informed or in disagreement with the role that culture could play (Less_cult group). On the contrary, the second group (2% of the sample) consists of people attending several times a month classical concerts, jazz concerts and contemporary concerts, theatres and dance performances, museums and exhibitions, circuses and street performances. They also consider that culture is a key factor in their choice to live in the city of Angers. Culture thus plays an important role in their life choices (More_cult group). The last group (59.3% of the sample) is made up of people in agreement with the 4 former statements and that rarely attend, or attend only several times a year, various cultural and sporting events. So this is a group that is (in terms of cultural proximity) between the first group (little close to culture) and the second group (very close to culture) (Medium_cult group).

[8] These 3 groups were obtained by keeping 15 axes which explain 70 % of the total variance

Determinants of belonging to one of these three groups are highlighted through the use of Logit models (see Table 4). Characteristics used as explanatory variables are gender, educational level, age, socio-occupational category of the respondent, the type of household and the monthly income of his household. These various socioeconomic characteristics are those commonly used to analyse the behaviour in terms of cultural goods or cultural events in the CE method (e.g. Willis and Snowball, 2009; Jaffry and Apostolakis, 2011; Grisolia and Willis, 2011, 2012; Duran et al., 2015). For each of the 3 groups, two types of models were estimated. In the first model, only the socio-occupational category is used as an explanatory variable in order to avoid problems of multicollinearity with other socio-economic characteristics. The second type of model considers as explanatory variables the other socioeconomic variables.

Table 4 Results from Logit estimation with characterisation of groups

	Less_cult group		**More_cult group**		**Medium_cult group**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	-0.557 ** (0.255)	-0.401* (0.205)	-5.481*** (1.002)	-4.550*** (0.450)	0.496** (0.251)	ns.
"Employers and self-employed occupations"	ns.	---	ns.	---	ns.	---
"Higher grade professional, administrative and managerial occupations"	ns.	---	ns.	---	ns.	---
"Intermediate occupations"	-0.828** (0.409)	---	ns.	---	0.765* (0.395)	---
"Employees"	REF	---	REF.	---	REF	---
"(Non- skilled) Labourers"	0.756** (0.314)	---	ns.	---	-0.670** (0.312)	---
"Retired people"	1.708*** (0.275)	---	ns.	---	-1.685*** (0.274)	---
"Other inactive people"	ns.	---	1.137* (0.657)	---	ns.	---
Household_1_pers	-0.496** (0.209)	-0.563** (0.231)	ns.	ns.	0.425** (0.207)	0.588*** (0.198)
Couple_no_child	---	ns.	---	ns.	---	ns.
Couple_with_child	---	ns.	---	ns.	---	ns.
Single_parent_Fam	---	REF	---	REF	---	REF
Female	ns.	ns.	ns.	ns.	ns.	ns.
Age_15_24	---	REF	---	REF	---	REF
Age_25_29	---	-0.678* (0.370)	---	ns.	---	0.629* (0.348)
Age_30_44	---	ns.	---	ns.	---	ns.
Age_45_59	---	ns.	---	ns.	---	ns.
Age_60_74	---	0.938*** (0.277)	---	ns.	---	-0.882*** (0.258)
Age_more_75	---	2.604*** (0.466)	---	ns.	---	-2.537*** (0.456)
No_qualification	---	0.940* (0.517)	---	ns.	---	ns.
Low_qualification	---	ns.	---	ns.	---	ns.
Baccalaureate	---	REF	---	REF	---	REF

2_years_Technical_Degree	---	ns.	---	ns.	---	0.462* (0.268)
Bac_Bach_M_D	---	ns.	---	ns.	---	ns.
Income_less_600	---	ns.	---	1.911*** (0.617)	---	ns.
Income_600_1250	---	ns.	---	ns.	---	ns.
Income_1250_2000	---	REF	---	REF	---	REF
Income_2000_3300	---	ns.	---	ns.	---	ns.
Income_3300_5000	---	-0.697* (0.383)	---	ns.	---	ns.
Income_more_5000	---	-2.066* (1.081)	---	ns.	---	1.866* (1.080)
Pseudo-R^2	0.13	0.16	0.09	0.08	0.11	0.13

p<0.1, **p<0.05, ***p<0.01 ; ns. : Not statistically significant

Respondents from the socio-occupational categories “Labourers” and “Retired people” have a higher probability than “Employees” to belong to the group distant from culture (Less_cult group). Respondents from the socio-occupational category “Intermediate occupations” as well as one-person households have a lower probability of belonging to this group. The opposite phenomenon is observed for the membership in the third group (Medium_cult group). Alternatively, respondents aged between 60 and 74 years and those aged over 75 years (and to a lesser extent those with no qualifications) have a probability of belonging to the first group larger than other respondents. Conversely, respondents with a monthly income between 3300 € and 5000 € or more than 5000 €, or one-person households have a lower probability of belonging to the first group. For belonging to the third group, the opposite is generally observed. It is also worth noting that non-working respondents (made up 95.5% of students or pupils) and respondents with less than 600 € per month have a higher probability of belonging to the group to which cultural and sports activities are important (More_cult group).

5 Models results and welfare measures

5.1 Models results

The database used for the estimates of the attributes value is the one for which we removed respondents who reported having answered at random concerning their choices or who are not consistent in their choices. This database (503 respondents) represents 88.6% of the initial sample and has the same characteristics as the latter (see Appendix A and Appendix B). Furthermore, the non-attendance[9] will be taken into account in the estimates of the different econometrics models: indeed, 41.7% of the respondents reported that at least one of the

[9] For a review on the reasons for non-attendance in Choice Experiments, see Alemu et al., 2013.

attributes had no influence in their choices. The predominantly ignored attributes are those concerning altruism or collective dimension of the project (i.e. Promotion_talent, representing 31.2% of the attributes reported as ignored) and the types of equipments offered by the music school (Specific_equipment, representing 28.2% of the attributes reported as ignored). Conversely, price (Price) is the attribute the least frequently mentioned as ignored (8.9%)[10]. Among respondents who reported not attending certain attributes, 81.4% of them stated that they had focused on one or more music school attributes to make their choices. For 76.7% of them, the reason reported is that the selected attributes were paramount. The rest of them declared that there were too many attributes to be compared (16%) or too many successive program choices to be made (7.3%). For the remaining respondents (18.6%), they declared that they systematically chose the status quo, whatever the characteristics of the proposed programs, the main reason being their lack of interest in learning music. Given these results, we can assume for the estimations that the MWTP associated with non-attended attributes is null[11].
Moreover, the probability of selecting a particular scenario is a function of attributes of this scenario and of the Alternative Specific Constant (ASC) which is specified to be equal to 1 when the item "no creation of music school" was selected and to be equal to 0 when either scenario A or B was selected.

5.1.1 Random Parameters Logit Model

In order to investigate whether or not the data exhibit unobserved heterogeneity in preferences across respondents, the Random Parameters Logit (RPL1) model is estimated[12] using the 4024 choices elicited from 503 respondents. The non-monetary attribute parameters have been specified to be random and normally distributed as respondents could have a positive or negative preference for these attributes (e.g. Morey and Rossmann 2003; Willis and Snowball, 2009; Jaffry and Apostolakis, 2011; Duran et al., 2015). The price parameter is not random so that the moments of willingness to pay distribution can exist (see, e.g. Daly et al., 2012). This RPL model is estimated using 1000 draws. The fit of this model, as measured by McFadden's Pseudo-R^2, is considered to be extremely good (see, e.g. Hensher and Johnson, 1981). The results of the RPL model (see Table 5) show the existence of heterogeneity in preferences for the five non-monetary attributes and the ASC. Indeed, the standard deviations are all significant

[10] The value concerning the possibility to practice instruments usually less commonly taught in music schools (Atypical_instruments) is 21.5%. This figure is 20.9% for the possibility to attend courses between 8pm and midnight (Hours), and 16.3% for the possibility to choose between group courses and individual courses whatever the instrument (Course_choice).
[11] 7.9 % of respondents are non-attendant for reasons of complexity and may grant a value to the ignored attributes. Thus, there could be bias of estimation by assuming a zero MWTP. However, this percentage being relatively low, this assumption was kept for estimations.
[12] The RPL model is estimated using Limpdep 10 Nlogit 5.0.

at 1% level. Hence, the use of an RPL model is justified. The negative sign of the payment coefficient indicates that the effect on utility of choosing a program with a higher payment level is negative. All the signs of non-monetary attributes are positive. All the attributes are higly significant at 1% level, except for the attribute concerning the existence of specific equipments (a recording studio and a rehearsal space) which is only significant at 10% level. The most valued attribute is the possibility to choose between individual and group courses. More surprisingly, respondents value more the existence of a school policy in promoting local musical talents intended for the whole population than the existence of specific equipments intended solely for users of the new school music.

5.1.2 Random Parameters Logit model with interactions

Even if unobserved heterogeneity is accounted in the first RPL model, one solution to detect the sources of heterogeneity among respondents (observed heterogeneity) consists in including in the model, interactions between the respondents specific cultural indicator and the five non-monetary attributes. The heterogeneity may in fact come from the high or low proximity of individuals to cultural and sports activities (Less_cult group and More_cult group). Note that socioeconomic variables aren't introduced directly into the estimates because these variables explain the membership of an individual to one of the three groups.This model has a slightly higher overall fit compared to the first RPL model (0.49 versus 0.48) (see Table 5). From the likelihood ratio test of the form: 2 (LL Unrestricted – LL Restricted) $\sim\chi^2$(difference in the number of parameters estimated between the two models), we reject the null hypothesis stating that the RPL with interactions does not perform better than the RPL model at 5 % significance level[13].

Similar to the first RPL model estimations, the RPL model with interactions presents significant standard deviations for the ASC and for the non-monetary attributes of the new music school. In this model, the attribute concerning specific equipments is not valued by respondents whatever their proximity to culture. Note that individuals with a low proximity to culture assign a significantly lower value for the other non-monetary attributes of the music school than other individuals. Belonging to the group of individuals close to culture leads to significantly different values (at the 10% level) for attributes related to instruments and related to promotion of talent, compared to individuals of the other two groups. Indeed, the coefficient associated with the possibility to practice instruments usually less commonly taught in music schools is important

[13] The resulting test statistic being distributed Chi-square with 10 degrees of freedom, the theoretical value of the test (18.31) is lower than its calculated value (2(-2257.98 + 2278.53) = 41.1). Consequently, we reject the hypothesis H_0 (without interactions) at 5 % significance level.

for these individuals. The phenomenon is reversed in the case of the attribute concerning the promotion of talents, that could indicate a more individualistic behaviour from them.

Table 5 Results of the RPL models

Attributes and interactions	RPL model (RPL1)		RPL model with interactions (RPL2)		MWTP RPL model with interactions [95% Confidence interval]+
	Coefficient (s.e)	Coeff. std (s.e)	Coefficient (s.e)	Coeff. std (s.e)	
Random parameters					
ASC (status quo)	0.946***	5.947***	0.972***	5.915***	142.80
	(0.342)	(0.418)	(0.311)	(0.439)	[51.63 ; 233.97]
Course_choice	1.872***	1.292***	1.977***	1.341***	290.52
	(0.143)	(0.202)	(0.171)	(0.203)	[243.52 ; 337.53]
Hours	1.311***	1.523***	1.421***	1.558***	208.91
	(0.145)	(0.162)	(0.174)	(0.174)	[159.67 ; 258.15]
Atypical_instruments	1.272***	1.111***	1.577***	1.052***	231.75
	(0.136)	(0.173)	(0.164)	(0.172)	[186.67 ; 276.82]
Promotion_talent	0.913***	1.393***	1.196***	1.367***	175.71
	(0.159)	(0.251)	(0.194)	(0.213)	[119.91 ; 231.52]
Specific_equipment	0.266*	1.605***	0.263	1.484***	38.70
	(0.159)	(0.209)	(0.198)	(0.186)	[-18.90 ; 96.30]
Price	-0.00679***		-0.00680***		
	(0.0003)		(0.0003)		
Non-random parameters					
Course_choice×	---	---	-0.519*	---	-76.21
Less_cult group			(0.272)		[-154.52 ; 2.10]
Course_choice×	---	---	0.357	---	52.41
More_cult group			(1.068)		[-256.39 ; 361.22]
Hours×Less_cult	---	---	-0.487*	---	-71.54
group			(0.286)		[-154.65 ; 11.56]
Hours×More_cult	---	---	-0.686	---	-100.89
group			(1.230)		[-453.07 ; 251.29]
Atypical_instruments×	---	---	-1.079***	---	-158.61
Less_cult group			(0.257)		[-231.89 ; -85.34]
Atypical_instruments×	---	---	3.197*	---	469.84
More_cult group			(1.645)		[-6.82 ; 946.50]
Promotion_talent×	---	---	-0.882***	---	-129.69
Less_cult group			(0.337)		[-227.18 ; -32.20]
Promotion_talent×	---	---	-4.670*	---	-686.39
More_cult group			(2.813)		[-1493.26 ; 120.48]
Specific_equipment×	---	---	0.082	---	12.12
Less_cult group			(0.313)		[-78.05 ; 102.29]
Specific_equipment×	---	---	1.073	---	157.67
More_cult group			(1.491)		[-269.54; 584.87]
Pseudo-R^2		0.48		0.49	
Final log-likelihood		-2278.53		-2257.98	
AIC/N		1.14		1.13	
Number of parameters (K)		13		23	
Number of obs. (N)		4024		4024	

* p<0.1, **p<0.05, ***p<0.01

(s.e): the standard errors are in brackets; + The confidence intervals for the estimates are obtained by using Krinsky and Robb procedure (1986) with 1000 draws.

Finally, one can observe that the ASC coefficient is positive, although on average, its value is not very high compared to other significant non-monetary attributes[14]. Nevertheless, this result seems to indicate the existence of a number of individuals who do not want the creation of a music school. The estimate of the RPL model (with interactions) by removing the "serial non-participants" (32.4%) indicated that the ASC coefficient is negative and that the existence of specific equipments is still not a significant attribute in the utility function of individuals (see Appendix C). The Pearson's Chi-square test ($p = 1.953.10^{-6}$) shows that there is a significant relationship between systematically choosing the status quo and belonging to the group of repondents characterised by a low proximity to culture. Indeed, among respondents who systematically choose the status quo, 58% of them indicate that they are not interested in music. This finding has led us to use the Latent Class Model to identify the existence or not of a class of individuals who are predominantly "serial non-participants".

5.1.3 Latent Class Model

Let us remind that in this type of model, individuals are divided into a finite and identifiable number of classes, each characterized by homogenous preferences. The cultural proximity indicator is used as a possible factor driving segmentation. Consequently, the socioeconomics characteristics of respondents affect choices indirectly through their impact on class membership via the indicator of cultural proximity. Following the recommendation by Scarpa and Thiene (2005), we examined the significance of the attributes across classes and found that the model with two classes should be preferred. The first part of the Table 6 displays the coefficients for attributes. The class membership parameters for the 2-classes solution are displayed in the second part of the table[15].

Concerning the first class (37.5 % of the 503 respondents), the utility coefficients for the two attributes Course_choice and Atypical_instruments are significant at 1% level, the one for the attribute Hours is significant at 5 % level, while utility coefficients for the two attributes Promotion_talent and Specific_equipement are not significant. The class membership reveals that a lower proximity to culture increases the probability that respondents belong to the first class. Note also that the significant positive value of the ASC indicates that on average individuals of this first class prefer the status quo. In connection with this result, we see that

[14] There exist hybrid models in which error components and random taste parameters are used in single specification especially when the ASC value is positive. This type of estimates has been realised and it indicates that the standard deviation of the latent error component is not significant at 10 % level. Therefore, these results are not reported in Table 5.

[15] Note that the parameters for the second class are equal to 0 that results from their normalization during estimation. Thus, the first class is described relative to the second class.

100% of "serial non-participants" belong to the first class and that 86.7% of respondents in this class are "serial non-participants". For the second class, all the coefficients for non-monetary attributes are significant at l% level, except for the attribute concerning specific equipments which is significant at 5% level. The most valued attribute is the possibility to choose between individual and group courses. Note also that the value of the ASC is negative indicating a disutility for these individuals to choose the status quo.

Table 6 Results of the Latent Class Model

Attributes	**Class 1 (37.5 % of the sample)**	**Class 2 (62.5 % of the sample)**	**MWTP Class 1 (€/respondent) [95% Confidence interval]$^{+}$**	**MWTP Class 2 (€/respondent) [95% Confidence interval]$^{+}$**
ASC (status quo)	5.144***	-1.336***	865.65	-323.42
	(0.609)	(0.095)	[513.90;1217.41]	[-358.86;-287.97]
Course_choice	2.588***	1.002***	435.52	242.52
	(0.448)	(0.063)	[244.30;626.74]	[211.75;273.29]
Hours	0.879**	0.820***	147.89	198.33
	(0.357)	(0.066)	[24.14;271.64]	[167.17;229.48]
Atypical_instruments	1.731***	0.588***	291.28	142.36
	(0.368)	(0.064)	[152.67;429.88]	[111.30;173.42]
Promotion_talent	0.488	0.527***	82.12	127.63
	(0.353)	(0.074)	[-34.34;198.59]	[91.09;164.17]
Specific_equipment	-0.436	0.171**	-73.34	41.39
	(0.338)	(0.067)	[-191.68;45.00]	[9.37;73.41]
Price	-0.00594***	-0.00413***		
	(0.0009)	(0.0002)		
Probability of belonging to the Class 1				
Constant	-0.881***			
	(0.135)			
Less_cult group	0.840***			
	(0.205)			
More_cult group	1.049			
	(0.754)			
Medium_cult group	REF			
Pseudo-R^2	0.43			
Final log-likelihood	-2508.43			
AIC/N	1.26			
Number of parameters (K)	17			
Number of obs. (N)	4024			

* p<0.1, **p<0.05, ***p<0.01 ; (s.e): the standard errors are in brackets; $^{+}$The confidence intervals for the estimates are obtained by using Krinsky and Robb procedure (1986) with 1000 draws.

The descriptive statistics for socioeconomic characteristics of the two classes are reported in Appendix D. As expected (see Table 4), retired people aged over 75 are over-represented in the first class as well as the low-graduates or people with middle income. Unlike the second class, there is an over-representation of students and pupils as well as people with low monthly income. This class is also made up of a majority of graduates.

5.1.4 Comparison between RPL Model with interactions and Latent Class Model

The Ben-Akiva and Swait (1986) test is used for comparing for non-nested probabilistic choice models (in our case: LCM *versus* RPL with interactions). This test rejects the null hypothesis that the LCM is the true specification. However, the use of a LCM confirms the existence of two classes of individuals with opposing attitudes concerning the opening of a new music school. Thus, these two approaches are complementary within the framework of the non-market valuation of cultural assets. Consequently, the RPL model with interactions and the Latent Class Model will be used to assess the marginal willingness to pay (MWTP) and the Compensating Variation (CV).

5.2 Marginal Willingness To Pay and Compensating Variation measures

The MWTP are calculated (see Table 5 upstream) using the equation:

$$MWTP_a = -(\beta_a / \beta_{price}) \qquad (1)$$

with β_a corresponding to one of the non-monetary attribute coefficients and β_{price} corresponding to the price coefficient used here as a proxy of the marginal utility of income.

The MWTP (and the confidence intervals) are also calculated for the two classes of the LCM by using equation (1) for each attribute and for the ASC (see Table 6 upstream). Note that the value of the ASC (associated with the status quo) is very different between the two classes, knowing that non-participants and individuals little closed to culture belong to the first class: thus, it is necessary to introduce the value of the ASC in computing the Compensating Variation associated with various scenarios (see Meyerhoff and Liebe, 2009).

In order to estimate the Compensating Variation for a future music school, three possible cases were considered:

- Scenario 1: a music school offering the possibility to choose between group courses and individual courses whatever the instrument, and the possibility to attend courses between 8pm and midnight
- Scenario 2: a music school offering the two previous characteristics plus the possibility to practice some instruments usually less commonly taught in music schools
- Scenario 3: a music school offering the three previous characteristics plus a school policy that promotes local musical talents

Estimates of Compensating Variation for each scenario are calculated using equation (2):

$$CV = - (1/\beta_{price}).(V_0 - V_1) \quad (2)$$

Where: V_0 represents the utility of the status quo and V_1 represents the utility of the scenario.

For instance, the CV for scenario 1 is calculated for the average respondent following equation (3):

$$CV_{Scenario1} = MWTP_{Course\_choice} + MWTP_{Hours} + ((MWTP_{Hours \times Less\_cult\ group} + MWTP_{Course\_choice \times Less\_cult\_group}) \times 0.40) + ((MWTP_{Course\_Choice \times More\_cult\ group} + MWTP_{Hours \times More\_cult\ group}) \times 0.02) - (ASC/\beta_{price}) \quad (3)$$

As expected, the CV for the change from the status quo increases with the number of possibilities (attributes) proposed by the future music school (see Table 7).

Table 7 Compensating Variation (€) for each scenario (for the average respondent)

	RPL with interactions	**Latent class model**	
		Class 1	**Class 2**
Scenario 1	297.31	-282.25	764.26
	[205.82;388.80]	[-468.25;-96.24]	[719.00;809.52]
Scenario 2	474.71	9.03	906.62
	[379.07;570.35]	[-114.30; 132.36]	[854.80;958.43]
Scenario 3	586.83	---	1034.25
	[485.41;688.26]		[973.59 ;1094.91]

In the case of the RPL model with interactions, the average CV per respondent is 297€ for scenario 1 and 587€ for scenario 3. For respondents belonging to the second class, due to their characteristics, these values are significantly higher. Conversely, if scenario 1 is proposed to the respondents belonging to the first class, the CV is negative: they prefer the status quo (i.e. no creation of a music school presenting simultaneously the characteristics offered by this scenario). It can be also observed that the value of CV associated with scenario 3 is not calculated for the first class, given that the Promotion_talent attribute is not significantly valued by the individuals of this class.

6 Conclusion

This article was intended to study in a hypothetical framework the question of the creation of a cultural asset, which corresponds at best to the *a priori* heterogeneous preferences of inhabitants, in the context of a control of public expenditures. Indeed, public authorities have to ensure that the planned cultural facility best meets the expectations of citizens, whether or not they will be users, to ensure the legitimacy of their project. We have shown that the CE method

is particularly well suited to this valuation problem from the moment the planned cultural facility corresponds to a "pure" cultural asset, that is to say a cultural asset particularly devoid of any tourist ambition. Conversely, the existence of a tourist dimension has great chances of altering the scope of this method when the latter is implemented with the view to a public policy valuation. Indeed, in the presence of individuals with heterogeneous preferences, the great difficulty even the impossibility to obtain a representative sample of the parent population of current or potential users, makes it risky to attempt any generalization of the results obtained in the framework of the survey. From this, we have selected as the object of valuation by the CE method, a municipal music school which can be regarded as a "pure" cultural asset, as part of a local public choice.

As the question of preferences heterogeneity of individuals involved in this cultural project is the central focus, we categorized individuals into 3 groups according to their proximity to cultural and sporting events and according to the importance that they assign to culture. We then compare the results from a simple RPL model and those from a RPL model which takes into account the heterogeneity of individual preferences via the introduction of crossing between attributes and the variables specifying the membership to one of the 3 previously constructed groups. The primacy of the RPL model with interactions then stresses the importance of taking into account the observable sources of interindividual heterogeneity. It validates *ex post* our sampling strategy, made possible by restricting our study to individuals (users or not) concerned by a local "pure" cultural asset, with the parent population of which is known. It emphasizes *a contrario* the fragility of the results of CE surveys obtained from unrepresentative samples, especially when these surveys aim to assess the social welfare associated with a cultural project and aim to enlighten public decisions. Our results connected with the RPL model with interaction thus indicate that only the attribute related to the music school's equipments is not valued significantly by individuals and that the valuation of other attributes differs according to the proximity to culture of these individuals. These results also provide information on the prioritisation of cultural attributes that is useful for public authorities: in particular, the fact that most of the individuals value the attribute having a collective dimension and, on the contrary, they do not value the attribute related to the music school's equipment is a result which was not *a priori* obvious. In connection with this issue concerning the relevant design of a music school, we calculated the CV measures relating to various music school scenarios which are more or less ambitious in terms of characteristics: these monetary measures of welfare can then be compared to the costs connected to the creation and then to the operation of these music schools. The identification of a change in the value of the ASC (that is positive or negative depending on whether serial non-participants are included or not in the estimates) indicates that there is a group of individuals not wishing the creation of a music school. This intuition is then

validated by the implementation of a Latent Class Model: the results show that there are two distinct classes of individuals regarding their attitude towards cultural attributes. Thus, the first class consists of individuals with a preference for the status quo and is composed of all serial non-participants and individuals identified upstream as little close to culture. Conversely, the second class is composed of individuals wishing this creation and valuing all the attributes including specific equipments even if the value of the latter is lower than the value for the promotion of talents.

Finally, all the estimates concerning RPL and LCM models have been made by taking into account the non-attendance phenomenon which mainly concerns the attributes relating to the promotion of local talents and to specific equipments. Otherwise, some results and conclusions would be biased, particularly concerning the role of these two attributes.

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Appendix A: Socioeconomic characteristics of respondents

Characteristics	Name and definition of variables	Total sample (568 respondents)	Sub-sample (503 respondents)	2011 Census of Angers
Gender	Female (=1 if respondent is a woman, 0 otherwise)	54.9 %	55.7 %	54.2 %
Between 15 and 29-year-old	Age_15_24 (=1 if the respondent is between 15 and 24 year old, 0 otherwise) Age_25_29 (=1 if the respondent is between 25 and 29 year old, 0 otherwise)	37.3 %	36.5 %	36.9 %
Between 30 and 59-year-old	Age_30_44 (=1 if the person is between 30 and 44 year old, 0 otherwise) Age_45_59 (=1 if the respondent is between 45 and 59 year old, 0 otherwise)	38.7 %	38.7 %	38.5 %
More than 60-year-old	Age_60_74 (=1 if the respondent is between 60 and 74 year old, 0 otherwise) Age_more_75 (=1 if the respondent is more than 75-year-old, 0 otherwise)	24.0 %	24.8 %	24.6 %
"Agricultural employers and agricultural self-employed occupations"	Farmer (=1 if the respondent is a farmer or a winegrower etc., 0 otherwise)	0.0 %	0.0 %	0.1 %
"Employers and self-employed occupations" (excluding agriculture)	Employers and self-employed occupations (=1 if the respondent is an employer or self-employer, 0 otherwise)	2.1 %	2.2 %	1.9 %
"Higher grade professional, administrative and managerial occupations"	Higher grade professional, administrative and managerial occupations (=1 if the respondent is an engineer, a doctor, an architect, or a financial manager, etc., 0 otherwise)	9.7 %	9.3 %	9.4 %
"Intermediate occupations"	Intermediate occupations (=1 if the respondent is a technician, a nurse or a schoolteacher etc., 0 otherwise)	9.7 %	9.7 %	14.5 %
"Employees"	Employees (=1 if the respondent is a services worker or a market sales worker etc., 0 otherwise)	25.5 %	25.5 %	15.8 %
"Labourers"	Labourers (=1 if the respondent is a manufacturing labourer or a mining labourer etc., 0 otherwise)	12.3 %	11.5 %	11.4 %
"Retired people"	Retired people (=1 if the respondent is retired, 0 otherwise)	21.5 %	22.7 %	23.0 %
"Other inactive people"	Other inactive people (=1 if the respondent is inactive, 0 otherwise)	19.2 %	19.1 %	23.9 %
Monthly income lower than 600 €	Income_less_600 (=1 if the monthly income is lower than	15.8%	16.1 %	10.0 %

	600 €, 0 otherwise)			
Monthly income between 600 and 1250 €	Income_600_1250 (=1 if the monthly income is between 600 and 1250 €, 0 otherwise)	18.8 %	19.1 %	15.0 %
Monthly income between 1250 and 2000 €	Income_1250_2000 (=1 if the monthly income is between 1250 and 2000 €, 0 otherwise)	25.0 %	25.2 %	25.0 %
Monthly income between 2000 and 3300 €	Income_2000_3300 (=1 if the monthly income is between 2000 € and 3300 €, 0 otherwise)	31.2 %	30.2 %	25.0 %
Monthly income between 3300 and 5000 €	Income_3300_5000 (=1 if the monthly income is between 3300 and 5000 €, 0 otherwise)	7.6 %	7.6 %	15.0 %
Monthly income more than 5000 €	Income_more_5000 (=1 if the monthly income is more than 5000 €, 0 otherwise)	1.6 %	1.8 %	10.0 %
One-person-household	Household_1_pers (=1 if the respondent lives alone, 0 otherwise)	57.6 %	57.0 %	55.7 %
Couple without children	Couple_no_child (=1 if the respondent lives in a couple without children, 0 otherwise)	20.8 %	20.9 %	20.7 %
Couple with children	Couple_with_child (=1 if the respondent lives in a couple with children, 0 otherwise)	16.8 %	17.3 %	15.2 %
Single parent family	Single_parent_Fam (=1 if the respondent lives alone with his/ her children, 0 otherwise)	4.8 %	4.8 %	8.4 %

Source: INSEE, 2011 Census of France and present survey

Appendix B: Qualifications of (out-of-school) respondents

(Highest) Diploma of the respondent	Name of the variable	Total sample	Sub-sample	2011 Census of Angers
No qualification	No_qualification (=1 if the respondent has no diploma, 0 otherwise)	5.2 %	4.9 %	16.8 %
Diploma lower than the Baccalaureate	Low_qualification (=1 if the respondent has a diploma lower than the Baccalaureate, 0 otherwise)	34.6 %	35.5 %	35.1 %
Baccalaureate (≈ A levels, High School Diploma)	Bac (=1 if the respondent has the Baccalaureate, 0 otherwise)	21.4 %	21.3 %	15.8 %
2 years technical degree ("senior training")	2_years_Technical_Degree (=1 if the respondent has a 2 years technical degree, 0 otherwise)	15.9 %	16.2 %	14.5 %
Baccalaureate, Bachelor' s degree, Master's degree or Ph. D	Bac_Bach_M_D (=1 if the respondent has the Baccalaureate or a higher degree, 0 otherwise)	22.9 %	22.1 %	17.8 %

Source: INSEE, 2011 Census of France and present survey

Appendix C: RPL results excluding serial non-participants

RPL with interactions [a]	Coefficient (s.e)	Coeff. std (s.e)	MWTP [95% Confidence interval][+]
Random Parameters			
ASC (status quo)	-1.769***	2.354***	-273.22
	(0.197)	(0.184)	[-327.49 ; -218.95]
Course_choice	1.713***	1.038***	264.55
	(0.149)	(0.151)	[221.46;307.63]
Hours	1.378***	1.358***	212.86
	(0.164)	(0.150)	[164.60;261.12]
Atypical_instruments	1.338***	0.928***	206.59
	(0.149)	(0.157)	[162.71;250.47]
Promotion_talent	1.130***	1.170***	174.56
	(0.177)	(0.197)	[121.22;227.91]
Specific_equipment	0.259	1.337***	39.95
	(0.173)	(0.173)	[-12.62 ; 92.53]
Price	- 0.00648***		
	(0.0003)		
Non-random parameters			
Course_choice×Less_cult group	-0.070		-10.76
	(0.229)		[-79.91; 58.40]
Course_choice×More_cult group	-0.018		-2.73
	(0.918)		[-279.54 ; 274.07]
Hours×Less_cult group	-0.239		-36.88
	(0.266)		[-118.33;44.57]
Hours×More_cult group	-0.996		-153.90
	(1.097)		[-488.94 ; 181.14]
Atypical_instruments×Less_cult group	-0.708***		-109.33
	(0.236)		[-181.18 ; -37.48]
Atypical_instruments×More_cult group	1.621		250.40
	(1.204)		[-115.90 ; 616.71]
Promotion_talent×Less_cult group	-0.485		-74.85
	(0.310)		[-169.21 ; 19.51]
Promotion_talent ×More_cult group	-3.069		-473.97
	(2.372)		[-1194.90;246.96]
Specific_equipment ×Less_cult group	0.239		36.85
	(0.293)		[-52.29 ; 125.98]
Specific_equipment×More_cult group	0.384		59.31
	(1.104)		[-273.54; 392.17]
Pseudo-R^2	0.35		
Final Log-likelihood	-1932.08		
AIC/N	1.44		
Number of parameters (K)	23		
Number of obs. (N)	2720		

* p<0.1, **p<0.05, ***p<0.01
(s.e): the standard errors are in brackets; [+] The confidence intervals for the estimates are obtained by using Krinsky and Robb procedure (1986) with 1000 draws.

[a] For this sample, the non-attendance of the attributes is the following one: Promotion_talent (39.1 %); Specific_equipements (34.7%); Atypical_instruments (24.7 %); Hours (24.1 %), Cours_choice (17.3 %); Price (7.3 %).

Appendix D: Profiles of respondents belonging to the two classes in LCM

Social, occupational and economic characteristics	Latent class Model Class 1 N=188	Class 2 N=315
"Employers and self-employed occupations"	2.7 %	1.9 %
"Higher grade professional, administrative and managerial occupations"	9.0 %	9.5 %
"Intermediate occupations"	7.4 %	11.1 %
"Employees"	26.1 %	25.1 %
"Labourers"	13.8 %	10.2 %
"Retired people" ***	29.8 %	18.4 %
"Other inactive people" ***	11.2 %	23.8 %
Age_15_24***	17.5 %	30.8 %
Age_25_29	12.2 %	9.5 %
Age_30_44	28.2 %	26.7 %
Age_45_59	9.6 %	12.7 %
Age_60_74	17.6 %	14.3 %
Age_more_75***	14.9 %	6.0 %
Female	51.6 %	58.1 %
Household_1_pers **	51.1 %	60.6 %
Couple_no_child **	25.5 %	18.1 %
Couple_with_child	18.6 %	16.5 %
Single_parent_Fam	4.8 %	4.8 %
No_qualification*	5.9 %	2.9 %
Low_qualification ***	40.4 %	23.5 %
Baccalaureate (≈ A levels, High School Diploma)	21.3 %	23.8 %
2_years_Technical_Degree*	13.3 %	19.0 %
Bac_Bach_M_D***	19.1 %	30.8 %
Income_less_600***	9.6 %	20.0 %
Income_600_1250*	22.9 %	16.8 %
Income_1250_2000	23.9 %	26.0 %
Income_2000_3300**	35.6 %	27.0 %
Income_3300_5000	6.9 %	8.0 %
Income_more_5000	1.1 %	2.2 %

Pearson's Chi-square test showed significant differences (*) at 10 % significance level; (**) at 5% significance level, and (***) at 1% significance level.