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The influence of cultural identity on the WTP to protect natural resources: some empirical evidence

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Abstract

This paper shows that cultural identity may have considerable influence on the WTP to protect natural resources. The Basque Country, the region with the highest ethnic homogeneity in Europe, serves as an example to illustrate how important this issue can be in the environmental valuation of natural resources. The rationale for this influence may be found in the deep roots of the Basque culture, a culture where *amalurra* (mother Earth), i.e. the natural environment, has a central role, as studies from diverse disciplines such as anthropology, psychology and political science have shown.

Simulated full distribution of the WTP to protect a Basque natural area using a random parameter logit model reveals that mean marginal WTP to protect its environmental attributes is approximately 60% higher if the cultural identity of the respondent is Basque. To our knowledge, this is the first application to show the influence of cultural identity on the WTP to protect natural resources. Our findings have some methodological and policy implications. On the one hand, failure to take into account cultural identitary issues could result in significantly biased results in benefit transfer applications. On the other hand, policies aimed at conservation natural resources should consider the cultural context in which they will be implemented.

Keywords: Choice modelling; willingness to pay; valuation; identity

JEL Classification: Q510

Contents

1. Introduction

Willingness to pay (WTP) to protect natural resources is the *product* of a highly complex psychological process, with many different factors influencing observed responses at many different levels. Economists have been more interested in analysing individuals' behaviour, so less attention has been paid to the value formation process that underlies behaviour. In other words, "economics has largely been preoccupied with the *results* of a rational choice rather than the *process* of choice" (Simon 1978).

Early models of belief-attitudes-behaviour proposed by Fishbein and Azjen (1975) have been further developed in recent years in order to account for the psychological processes underlying an observed WTP response. Bateman, Lovett and Brainard (2005) present a conceptual framework for the value formation process that highlights the base-state influences in the process. Base-state influences, including individual factors (income, socio-economic factors, etc.), world views (personal constructs of self and environment), social factors (family, work, etc.), cultural influences (cultural types, ethnographic differences) and contextual factors (local environment, home area, etc.) are independent of the environmental good under valuation (Georgiou et al. 1998). In a subsequent phase, these basic elements shape the base-state positive and normative beliefs with which an individual enters a stated preference experiment. Once new information is given in the experiment, the individual updates her belief set and shapes the attitudes and norms that will influence her behaviour. Furthermore, information provided in the questionnaire, beliefs and attitudes towards specific behaviour mould motivation. Use and non-use motives combine to express a value statement, the individual's WTP. This statement of value serves as specific behaviour (an actual payment) or as a feedback process that feeds into the individual's base-state beliefs.

The values elicited in stated preference experiments are theorised as Hicksian welfare measures of economic value for an environmental resource. Uncertainty and lack of familiarity with the environmental good under valuation raise concerns about the factors that influence an individual's expressed preferences. Individuals may need to consider their basic values when answering stated preference questions about the environment (Dietz, Fitzerald, and Shwom 2005). Schkade and Payne (1994) argue that responses to contingent valuation questions are highly sensitive to the task and context, which can influence the process of preference construction. The importance of attitudes and ethical beliefs in understanding WTP has also been highlighted (Ojea and Loureiro 2007;Pouta 2004;Spash 2000;Stern, Dietz, and Guagnano 1995).

Although cultural factors they have been theoretically considered as having an influence on an individual's preferences, there is limited empirical evidence of their existence and magnitude. It has been reported, for example, that aboriginal and Torres Strait Islander peoples in Australia have a rich cultural diversity that is closely linked with their environment. The National Strategy for the Conservation of Australia's Biological Diversity states that "many Australians place a high value on native plants and animals, which contribute to a sense of cultural identity, spiritual enrichment and recreation" (Australian Government 2005). Field research, however, has mainly focused on the capacity of non-market valuation techniques for capturing values from different cultures, such as Aboriginal populations from Canada (Murray et al. 1995) or Maori communities in New Zealand (Awatere 2005). In analysing the influence of ethnicity and language on WTP, Loomis et al. (2006) conclude that language rather than ethnicity could influence WTP responses. Empirical evidence on the influence of cultural identity on the WTP to protect natural resources is limited and non-conclusive. While (Murray, Adamowicz, Beckley, MacDonald, Just, Luckert, and Phillips 1995) find that non-aboriginal peoples' WTP is much greater than that of aboriginals, American Indian identity has been found to be positively correlated with expressions of support for salmon recovery in the United States (Montgomery and Helvoigt 2006).

In this paper we provide some empirical evidence of the influence of cultural identity on stated WTP to protect natural resources. An empirical application of the choice modelling technique in the Basque Country, an area with a culture in which the natural environment has a central role, serves as an example to illustrate how important this issue can be in the environmental valuation of natural resources. The fact that the Basque Country has the highest ethnic homogeneity of any European region (Cavalli-Sforza and Bodmer 1999), allows us to nicely differentiate this ethnic group from the rest of the population. The paper further aims to improve choice theory by furthering our understanding of the motives behind WTP values elicited in stated preference questionnaires.

The rest of the paper is structured as follows. The next section provides some insights into the role of nature in ancient Basque culture. Section 3 describes the methodology used in this experiment, i.e. the choice modelling technique. Section 4 presents the case study: the Jaizkibel natural area. Section 5 analyses the main results and Section 6 gives some concluding remarks.

2. The role of nature in Basque culture

The Basque Country is a stateless nation[1] made up of seven provinces: four in Spain (Bizkaia, Gipuzkoa and Araba, which form the Basque Autonomous Community, and Navarre) and three in France (Lapurdi, Nafarroa Beherea and Zuberoa). The origin of the Basques remains unresolved, though many anthropologists consider them to be the oldest ethnic group in Europe and the only one that was not swamped by the arrival of the Indo-Europeans. Differences detected in genetic studies show that the Basques had a long history of isolation with a small population size. This may also explain the survival of their distinctive ancient language, *euskera*.

Euskera is a peculiar language that has not yet been related to any other language and that has been continuously spoken within the same territory for longer than any other surviving language in Europe. It plays a central role in the Basque culture. In fact, Basques identify themselves as *euskaldun* or “Basque speakers” and their country as Euskal Herria or “Country of the Basque Language”. Basques also have a close attachment to their home. The *baserri*, which translates as “family-run farm”, is their home and the root of their family. Modern Basque surnames based on the geographical features of the old family farms maintain a link to their rural family origins and to their land.

The psychosocial structure of traditional Basque culture has been defined as matriarchal, i.e. centered on a matriarchal-feminine archetype, This influences and merges the traditional Basque social group rather differently from the patriarchalism found among Indo-Europeans (Ortiz-Osés and Mayr 1981). As these authors argue, this is not to say that Basque society is a matriarchy (in the sense of a society dominated by women) but rather a matriarchalism, a psychosocial structure in which the Mother/Woman and the projection of women as Mother Earth/Nature play a central role.

The central role played by nature in the Basque culture is likewise reflected in the mythology of the area, in which *Mari* is the top-ranking female goddess, representing *amalurra* or “Mother Earth”, as a symbol of life and nature. According to Ortiz-Osés and Mayr (1981), the archetypical background of Basque mythology should be placed in the context of the Palaeolithic era, dominated by typical matriarchal-naturalist symbology. The following table sums up some categories that define the Basque culture as matriarchal-naturalist, by contrast with the patriarchal-rationalist Indo-European type:

[1] Stateless nations such as the Basque Country, Scotland and Quebec are political entities with relatively homogeneous populations and cultural roots (Costa-Font and Tremosa-Balcells 2007).

Table 1. Some categories implied by different cultural identities

Matriarchal-Naturalist	*Patriarchal-Rationalist*
Communalism (Community)	Individualism (society)
Naturalism	"Culturalism"
Mother-Nature	Father-Law
Land-family-clan	Reason-State
Irrationalism (Magic, myth, utopia)	Rationalism
Custom	Law
The come about (cyclic)	The being (lineal)
The verb (dynamic)	The noun (static)
Time, mother, dark	Space, day, clear
Group identity	Un-identity

Source: (Ortiz-Osés and Mayr 1981)

Similarly, political scientists have stressed the 'communitarian' nature of Basque environmentalist movements: natural space is the territory in which they live, to which they feel themselves to be morally and emotionally linked, and they defend it because they perceive that their survival as a human community depends upon the preservation of that specific territory (Barcena et al. 2003).

Social psychologists have also highlighted the influence of Mother Earth on the Basque identity. Psychological studies based on the Rorschach psychodiagnosis theoretical framework have shown that the union of the Basques with Mother Earth appears fundamentally in two aspects: on the one hand, in identification with the Mother; and on the other hand in the significantly high percentage of animal responses in the Rorschach Inkblot Test, meaning identification with the environment (Redondo 1983). Furthermore, this was found to be true not just for people living in rural areas but even for Basque executives (Redondo 2001). The archetype of the Great Mother is identified by anthropologists as union with the land, with the natural environment (Jung 1956).

Summing up, it is clear that Basque culture assigns a central role to *amalurra* (Mother Earth), so the natural environment holds a central position in traditional Basque culture. According to various social science studies, a matriarchal culture such as that of the Basques feels a close attachment to the land. The influence of cultural identity appears at both a conscious-superficial level and a structural-unconscious level. As will be shown later, this may be reflected in people's stated WTP to protect natural resources.

3. Methodology

Choice Modelling is a stated preferences method of valuation that converts subjective choice responses into estimated parameters. Choice experiments were first used in marketing research during the 70s in order to analyse consumer choices. Later, this technique was used in transport economics and health economics, and more recently in environmental economics. A comprehensive overview of this valuation method can be found in Louviere, Hensher and Swait (2000), Train (2003) and Alpizar, Carlsson and Martinsson (2003).

Choice Modelling is based on random utility theory. Under this theoretical framework, the individual indirect utility function is defined as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij}, \tag{1}$$

where U_{ij} is the latent utility for individual *i* from the choice alternative *j*, V_{ij} is the deterministic, observable, component of utility and ε_{ij} is the random, unobservable, element of the utility. Thus, selection of alternative *j* over alternative *h* implies that the utility of U_{ij} is greater than that of U_{ih}. The randomness of the utility function suggests that only analysis of the probability of choosing one alternative over another is possible. Under the assumption that the error terms of the utility function are independently and identically distributed following a type I extreme value (Gumbel) distribution, the choice model can be estimated using a multinomial logit (MNL) specification (McFadden 1974, Louviere *et al.* 2000). This statistical model represents the probability of choosing an alternative j such that the utility of that alternative is greater than the utility of all other alternatives. The probability of an individual *i* choosing an alternative *j* is

$$P(ij) = \frac{\exp(\mu \cdot V_{ij})}{\sum_{h \in c} \exp(\mu \cdot V_{ih})},$$

where μ is a scale parameter (often normalized to 1, implying constant error variance) and *c* is a choice set. The deterministic part V_{ij} is usually assumed to be a linear and additive function in the attributes and sociodemographic variables, that is

$$V_{ij} = \beta X_{ij} ,$$

where X_{ij} is a vector of environmental attributes and respondent's individual characteristics that influence utility.

The MNL model relies on some restrictive assumptions: firstly, it assumes that choices are consistent with the Independence of Irrelevant Alternatives (IIA), a hypothesis that is not usually fulfilled empirically; and secondly, it assumes that preferences for different attributes are homogenous among individuals. The remarkable growth in the use of random parameters (RPL) models or mixed logit models in recent years can be partly explained by their inclusion in standard econometric software and partly by their flexible assumptions (Train 2003). There are three main advantages of the RPL model: it avoids any reliance on the IIA property; preference heterogeneity is directly incorporated through individuals' random taste variations; and it is capable of incorporating correlation across choice sets and alternatives. Its popularity has kept growing in spite of some problems related to inference and model selection (Brownstone 2001).

In the RPL model, a random term whose distribution over individuals and alternatives depends in general on underlying parameters is added to a classical utility function associated with each alternative, that is:

$$U_{ij} = \beta X_{ij} + \eta_i X_{ij} + \varepsilon_{ij}$$

Where η_i is a vector of deviation parameters and the error component, ε_{ij}, is still identically and independently Gumbel distributed. In this way we get an RPL or error component specification, depending on whether the vector of deviation parameters is incorporated into β (RPL) or ε_{ij} (error component specification). The difference between the two specifications is entirely interpretational. However an important point is that this flexible model nests many particular specifications used in the relevant literature, e.g. an analog to nested logit can be obtained by particular specification of mixed logit (Brownstone 2001). So, the RPL is a model in which an individual's utility from any alternative in the choice set includes a stochastic part that may be correlated over alternatives and that may be heteroskedastic (Henser, Rose, and Greene 2005). In this model, preference heterogeneity is directly incorporated into the vector of parameters, so that the vector of coefficients of attributes is different for each individual, β_i, and it is allowed to deviate from the population mean coefficient β by the vector of deviation parameters η_i.

Compensating surplus (CS) welfare estimates for the RPL model may be obtained from Hanemann, 1984 and Train, 1988:

$$CS = -\frac{1}{\alpha}\left[\ln(\sum \exp(\beta X_{ij}^{0}) - \ln(\sum \exp(\beta X_{ij}^{1})\right]$$

where α is the marginal utility of income (usually represented by the coefficient of the payment attribute) and X_{ij}^{0} and X_{ij}^{1} represent the vector of environmental attributes at initial level (status quo) and after the change levels, respectively. Simplifying the above equation, the marginal value of a change in one attribute with respect to another is measured through the ratio of the two coefficients. Therefore, the WTP for a marginal change in the level of provision of each environmental attribute (i.e. the marginal rate of substitution between income change and this attribute change) is obtained by dividing the coefficient of the attribute by the coefficient of the payment attribute.

In this paper we focus on the RPL model mainly because it accounts for unobserved heterogeneity by allowing the parameters of the utility function to be random and because it considers that each respondent makes choices in more than one choice situation. This methodological framework has been used recently in environmental and ecological economics applications, for example in the valuation of forestry goods and services (Brey, Riera, and Mogas 2007), in the valuation of the environmental benefits of converting cropland to forest and grassland (Wang et al. 2007) and in determining efficient, sustainable wetland management policies (Birol, Karousakis, and Koundouri 2006). The same methodology is used in the field of transport, e.g. in Espino, Martín and Román (2008), to detect the presence of preference heterogeneity in an airline choice context. In another recent related application, Carlsson and Martinsson (2008) estimate marginal willingness to pay for a reduction in power outages using a choice experiment survey and RPL specification.

4. Case study: the Jaizkibel natural area

4.1. Description of the site

Jaizkibel is a 2.400 hectare natural site that contains 15 zones declared of high ecological interest by the European Union. In 2004 it was incorporated into the European Natura 2000 network. According to scientific studies, the landscape of this area is highly valuable because the mountain runs along the coast with an abrupt fall at the western end, with cliffs up to 240 meters high. In these cliffs, which are geologically highly valued because of the layout of the sandy strata, lives the *armeria euskadiensis*, an endemic plant of the Basque coast catalogued as being in danger of extinction. At the eastern end the terrain is not so abrupt and there are small beaches and precipices formed by the courses of streams flowing into the Bay of Biscay. In these areas, interesting species of flora can be found such as tropical ferns (*Woodwardia radicans* and *Trichomanes speciosum*) which are extremely rare in the rest of Europe. The rest of mount Jaizkibel comprises a non-wooded forest area with some scrubland and pasture land associated with local “baserris” (family-run farms). Nevertheless, some areas maintain their original tree cover with groves of *Quercus robur* and *Quercus pyrenaica* oaks. Colonies of lesser black-backed gull and yellow-legged gull (*Larus fuscus* and *Larus cachinnans*) nest on the cliffs. Other interesting birds such as the European storm-petrel (*Hydrobates pelagicus*), the green cormorant (*Phalacrocorax aristotelis*) and the peregrine falcon (*Falco peregrinus*) can also be found in this natural area. On the mainland there are numerous species of amphibians, reptiles and mammals including the palmate newt (*Triturus helveticus*), the midwife toad (*Alytes obstetricans*), the dark green whip-snake (*Coluber viridiflavus*) and the greater horseshoe bat (*Rhinolophus ferrumequinun*). On its seabed, it harbours different types of molluscs, sea urchins and crustaceans, as well as some species of fish and dolphins. The seabed in the area is also home to various types of green, red and brown seaweed, and one of the most important patches of red seaweed on the Basque coast. In short, Jaizkibel’s most outstanding environmental attributes are its landscape, its autochthonous fauna and flora and its seabed life. Detailed information about the environmental characteristics of mount Jaizkibel and the survey design can be found in Hoyos et al. (2008).

4.2. Survey design

Environmental attributes and level of provision become critical aspects of any choice experiment given that the only information about preferences provided by respondents takes the form of choices between these options (Hensher 2007). According to Lancaster (1991), an environmental attribute can be considered relevant if ignoring it would change our conclusions about a consumer's preferences. The construction of the choice sets included in an experiment requires a correct definition of the change to be valued and the attributes and levels that would be used. Previous investigation on the environmental characteristics of mount Jaizkibel, expert advice and focus groups facilitated the definition of environmental attributes and levels of provision. Following focus group sessions, a pilot survey using open-ended contingent valuation questions helped to identifying the appropriate levels of cost attribute.

The questionnaire was designed by describing certain changes in the quality of mount Jaizkibel's main attributes. It stated that if this mount was not protected, these attributes could suffer different levels of environmental degradation in the future because of human activities. The attributes and levels considered in this study were (see Table 2, levels with asterisks represent the status quo scenario): (1) landscape, measured by the percentage of surface area on which today's landscape could be seen in the future; (2) flora, measured by the future level of protection of today's population of the *armeria euskadiensis* endemism; (3) avifauna, measured by the future level of protection of today's population of lesser and peregrine falcons; (4) seabed, measured by the future level of protection of today's extension of red algae; and (5) annual contribution in euros, varying from 5 to 100 €.

Table 2. Attributes and levels considered

Attribute	**Level**							
Landscape	40%*	60%	80%	100%				
Flora	50%*	70%	85%	100%				
Fauna	25%*	50%	75%	100%				
Seabed	50%*	70%	85%	100%				
Annual payment	0 €*	5 €	10 €	15 €	20 €	30 €	50 €	100 €

Combining all these attributes and levels, around two thousand different combinations were obtained ($4^4 x 7^1$). As usual when the universe of alternatives is very large, statistical design methods were used to simplify the construction of choice sets (Louviere, Hensher, and Swait 2000). A main effects fractional factorial design with second order interactions was used to reduce the number of protection alternatives. The final version of the questionnaire had two choice sets, each formed by the status quo or business as usual option plus two alternative protection programmes (programme A and programme B). The complexity of the choice task was satisfactorily pre-tested in the focus group.

The payment vehicle proposed was an annual contribution by all basque citizens to a Foundation exclusively dedicated to protecting mount Jaizkibel. This payment vehicle was proposed because Europeans are unfamiliar with more typical payment vehicles such as levies on income taxes (Morrison, Blamey, and Bennett 2000). The “don’t know” option was included in order to avoid the *“yea saying”* bias (Arrow et al. 1993). These answers were eliminated from the data set, assuming that these respondent’s preferences were similar to the rest of the sample.

The questionnaire was finally structured in three parts. The first part was devoted to explaining the environmental quality change to be valued, i.e. the current situation of mount Jaizkibel was briefly described along with some possible future damage to its environmental attributes. The second part (preference elicitation part) contained the choice experiment questions. The last section contained some debriefing and socioeconomic questions. In this part, one question asked respondents to state their cultural self-identity, whether it was Basque or not. The question was actually formulated as: “would you say that your cultural identity is Basque?”, with three possible answers: below average, average, above average.

4.3. Data collection

The questionnaire was administered through in-person computer-aided individual home interviews. The relevant population considered was that of the Basque Autonomous Community and Navarra in Spain and that of some French cities close to the Spanish border, accounting for 2.5 million people aged at least 18. The pilot was conducted in October 2006, while the final survey was undertaken between November and December, 2006. A stratified random sample of 636 individuals was selected from the relevant population. The strata used included age, gender and size of the town of residence, following official statistical information (EUSTAT). In each location, the questionnaires were distributed using random survey routes.

5. Results

Table 3 describes the sociodemographic variables used in this application and summary statistics. The mean age (43 years) and gender (48% male and 52% female) of respondents are in consonance with the average age and gender of the relevant population. Other explanatory variables considered were CHILDREN (taking the value 1 if respondent had children and 0 otherwise), NGO (taking the value 1 if respondent was a member of an environmentalist organisation and 0 otherwise), INCOME (for the respondent's net monthly income), EDUCATION (for respondent's level of education with 1 being the lowest and 5 the highest), IDENTITY (taking the value 1 if the respondent considered herself as having a Basque identity at an above average level and 0 otherwise), VISITOR (taking the value 1 if the respondent was a user of the natural area and 0 otherwise) and CLIMBER (taking the value 1 if respondent was a climber and 0 otherwise).

The last column of Table 3 presents the variance inflation factor usually used in regression to analyse the problem of possible multicollinearity. Values greater than 30 or 40 indicate highly collinear data. In our case all values (except the NGO variable, which is not used in our final estimations) are very low, so no problem of multicollinearity is expected.

Table 3. Sociodemographic variables and summary statistics

	Mean	Std. Dev.	Minimum	Maximum	Cases	Missing	VIF
AGE	42.8211	17.1186	18	93	408	0	0.0035
GENDER	0.4730	0.4994	0	1	408	0	4.1836
CHILDREN	0.5686	0.4954	0	1	408	0	7.0384
NGO	0.0515	0.2210	0	1	408	0	20.9382
INCOME	883.7740	727.7220	0	3200	265	143	<0.0001
EDUCATION	2.7917	1.3038	1	5	408	0	0.3321
IDENTITY	0.2304	0.42117	0	1	408	0	5.8913
VISITOR	0.5368	0.4987	0	1	408	0	4.4215
CLIMBER	0.6275	0.4836	0	1	408	0	4.5206

MNL and RPL model estimations are provided in Table 4. All the coefficients of the environmental attributes in the models have the expected positive signs, meaning that protection is more highly valued than loss. The negative coefficient of the payment attribute is also as expected, indicating that the probability of accepting an annual contribution for protecting mount Jaizkibel's attributes decreases as the price increases.

Model 1 is a fixed parameter logit specification including only attribute variables, that is, the deterministic part in (1) was defined as:

$$V_{ij} = \beta_1 + \beta_2 PAYMENT_{ij} + \beta_3 LANDSCAPE_{ij} + \beta_4 FLORA_{ij} + \beta_5 AVIFAUNA_{ij} + \beta_6 SEABED_{ij} \,. \quad (2)$$

In this (and following) specifications, we use an alternative-specific constant β_1 only in the equation of the status quo option. The equations for Option A and B have no alternative-specific constant because they are both generated from the same experimental design.

Significant interactions of all attributes with sociodemographic variables from Table 3 were then investigated. Only the interactions of the payment attribute with AGE, CHILDREN, IDENTITY and CLIMBER, and the landscape attribute with CLIMBER turned out to be significant at the 10% level in this fixed parameter specification. That is, the deterministic part in (1) was defined in Model 2 as:

$$
\begin{aligned}
V_{ij} = {} & \beta_1 + \beta_2 PAYMENT_{ij} + \beta_3 LANDSCAPE_{ij} + \beta_4 FLORA_{ij} + \beta_5 AVIFAUNA_{ij} + \\
& \beta_6 SEABED_{ij} + \beta_7 PAYMENT_{ij} \cdot AGE_{ij} + \beta_8 PAYMENT_{ij} \cdot CHILDREN_i + \\
& \beta_9 PAYMENT_{ij} \cdot IDENTITY_i + \beta_{10} PAYMENT_{ij} \cdot CLIMBER_i + \\
& \beta_{11} LANDSCAPE_{ij} \cdot MOUNTAINEER_i
\end{aligned}
\qquad (3)
$$

Note that the fit of model 2 (which includes interaction terms) is significantly higher than the fit of model 1, as shown by the corresponding values of likelihood functions.

Finally, an RPL specification is presented in Model 3. The randomness of all coefficients included in (3) was tested using the Lagrange Multiplier (LM) test proposed by McFadden and Train (2000). Although it is simple and powerful, its ability to identify which error component should be included in a general mixed logit specification is more limited (Brownstone 2001). Several combinations of random and fixed parameters in (3) were tested and the results were combined with *t*-statistics of the estimated standard deviations of the random parameters. This procedure led unambiguously to just two random parameters: payment and avifauna.

Table 4. Model estimations

	Fixed parameter models						Random parameter model					
	Model 1			Model 2			Model 3					
	Coef.		*St. Error*	*Coef.*		*St. Error*	*Coef.*		*St. Error*	*St. Dev. Par.*		*St. Error*
Constant	-0.6677	**	0.303	-0.7316	**	0.3076	-0.7288	**	0.3124			
Payment	-0.0139	***	0.002	-0.0165	***	0.0061	-0.0167	**	0.0085	0.0028	**	0.0014
Landscape	0.0078	***	0.0024	0.0073	*	0.0044	0.0073	*	0.0044			
Flora	0.0165	*	0.0032	0.0073	*	0.0043	0.0074	*	0.0043			
Avifauna	0.007	**	0.0042	0.0079	***	0.0025	0.008	***	0.0026	0.001	***	0.0003
Seabed	0.007	***	0.0024	0.0079	***	0.0024	0.0079	***	0.0024			
Age*Payment				-0.0003	*	0.0002	-0.0003	*	0.0002			
Children*Payment				0.0094	*	0.005	0.0094	**	0.0051			
Identity*Payment				0.0095	**	0.0043	0.0095	**	0.0043			
Mountaineer*Payment				0.009	**	0.0045	0.0091	*	0.0049			
Mountaineer*Landscape				0.0136	***	0.0052	0.0135	***	0.0052			
lnL			-588.07			-574.03						-573.93
N			687			687						687

**** 1% significance level, ** 5% significance level, * 10% significance level*

The value of the likelihood function in the RPL model does not vary substantially from that with fixed parameters and that is why an LR test does not reject the null hypothesis of non-randomness of the payment and avifauna coefficients. Nevertheless, an important characteristic of the LR test is that it does not take into account the curvature of the likelihood function. That is why, instead of accepting this result, we still opted to consider the two coefficients random and analysed this issue more deeply. The null hypotheses of non-randomness of the PAYMENT and AVIFAUNA parameters were clearly rejected by the Lagrange Multiplier test proposed by McFadden and Train (2000), which is based on the significance of new artificial variables. These significance tests were carried out in our case via a Wald test. This conclusion is also supported by the values of *t*-statistics (1.97 for payment and 3.06 for avifauna, that is, rejection of constant parameters at 5% and 1% respectively) corresponding to the estimation of the standard deviations of the parameter distribution.

Initially, normal distribution for the random parameters was assumed, though several statistical distributions were subsequently tested in order to find a proper distribution for them. Following Hensher, Rose and Greene (2005), we opted for a triangular distribution, restricting their spreads (by equalling them to the estimated mean values) in order to guarantee their negative (payment) or positive (avifauna) signs. This is an important issue from a theoretical point of view since these coefficients should not change their signs. It is true that other distributions could lead to a better fit, but at the expense of less realistic WTP distributions. Louviere *et al* (2005) and Hensher (2006) stress the importance of specifying those distributions in such a way as to lead to more reasonable WTP distribution. Then the remaining sociodemographic variables not included in the model were tested as possible sources of preference heterogeneity around the mean of the two random parameters, but none of them was found to be significant.

The positive sign of the CHILDREN, IDENTITY and CLIMBER coefficients interacting with the payment coefficient indicates that WTP to protect environmental attributes among people with children, those with a Basque cultural identity and climbers is higher than among the rest. The negative sign of the AGE coefficient interacting with the payment coefficient reveals that each additional year of an individual's age decreases her WTP. On the other hand, the positive interaction between the term of CLIMBER and the landscape attribute suggests that, all else being equal, climbers like the landscape more than the rest, which leads to higher a WTP for landscape among climbers.

WTP estimates need to take into account the random nature of the payment and avifauna parameters. For this purpose, values for these coefficients were generated following the

Krinsky and Robb procedure (Krinsky and Robb 1986) using the triangular distributions and then the full distribution of the WTPs was simulated distinguishing by age of respondent, whether she had children, considered her identity to be Basque or was a climber. That is, WTP for any attribute was computed as:

$$WTP_{attribute} = -\frac{\hat{\beta}_{attribute} + \hat{\sigma}_{attribute} \cdot t_1 + \hat{\beta}_{socdem.var.*attribute} \cdot Socdem.Var}{\hat{\beta}_{payment} + \hat{\sigma}_{payment} \cdot t_2 + \hat{\beta}_{socdem.var.*payment} \cdot Socdem.Var.},$$

where $\hat{\beta}_{payment}$ and $\hat{\sigma}_{payment}$ are estimations of the mean and standard deviation of the random payment coefficient, $\hat{\beta}_{attribute}$ and $\hat{\sigma}_{attribute}$ are estimations of the mean and standard deviation of the random attribute coefficient (for landscape, flora and seabed $\hat{\sigma}_{attribute}$ is zero because their coefficients are non-random), $\hat{\beta}_{socdem.var.*payment}$ and $\hat{\beta}_{socdem.var.*attribute}$ are the estimated non-random coefficients of the interaction terms of payment and attribute with one of the sociodemographic variables respectively and *Socdem.Var* is the value of the sociodemographic variable itself. Finally t_1 and t_2 have triangular distributions with lower limit -1, upper limit 1 and mode 0. Thus, for example, WTP for the avifauna attribute and individuals aged 30 with a Basque identity can be simulated using:

$$WTP_{avifauna} = (0.0080 + 0.0010 \cdot t_1)/(-0.0167 + 0.0028 \cdot t_2 + (-0.0003) \cdot 30 + 0.095 \cdot 1).$$

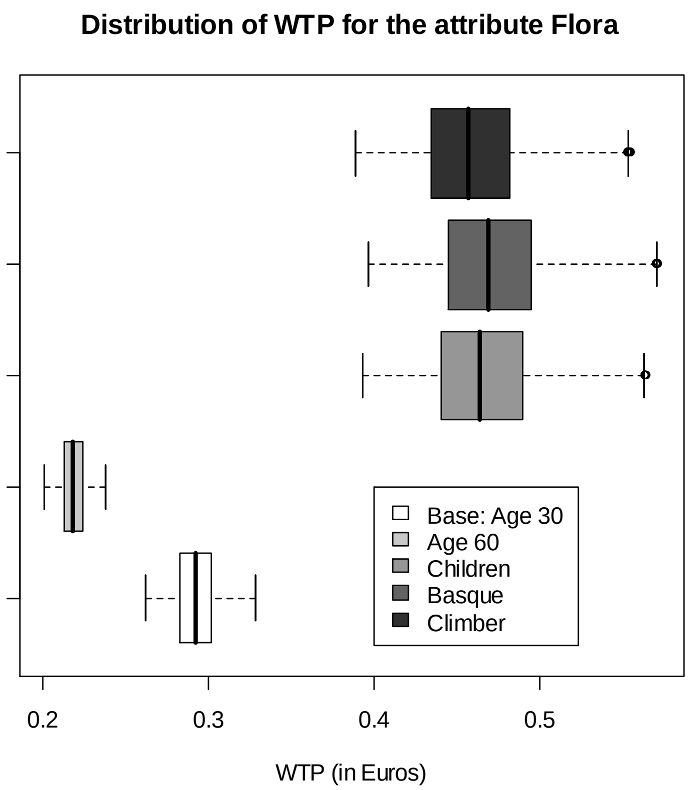
Note that CHILDREN, IDENTITY and MOUNTAINEER are dummy variables but AGE is a quantitative variable ranging from 18 to 93. For comparison purposes, we set an age of 30 as a defining base group to which all the other groups were compared. Table 5 presents means and standard deviations of simulated WTPs for all four environmental attributes.

Table 5. Simulated WTP

	Landscape		Flora		Avifauna		Seabed	
	Fixed	*Random*	*Fixed*	*Random*	*Fixed*	*Random*	*Fixed*	*Random*
	WTP	***mean WTP (st. dev.)***	***WTP***	***mean WTP (st. dev.)***	***WTP***	***mean WTP (st. dev.)***	***WTP***	***mean WTP (st. dev.)***
Base Group	0.291	0.291	0.292	0.292	0.316	0.316	0.313	0.312
		(0.013)		*(0.013)*		*(0.021)*		*(0.014)*
Older people	0.216	0.217	0.217	0.219	0.235	0.236	0.233	0.233
		(0.013)		*(0.007)*		*(0.014)*		*(0.008)*
People with children	0.464	0.463	0.467	0.466	0.505	0.504	0.501	0.498
		(0.034)		*(0.034)*		*(0.004)*		*(0.036)*
Mountaineers	1.299	1.301	0.456	0.460	0.493	0.497	0.489	0.491
		(0.094)		*(0.033)*		*(0.043)*		*(0.035)*
Basques	0.467	0.468	0.471	0.471	0.508	0.509	0.504	0.503
		(0.035)		*(0.035)*		*(0.045)*		*(0.037)*

The information presented in Table 5 related to the flora attribute is extended in Figure 1, which shows a box and whisker plot of the resulting WTP estimates. The base case reports the mean marginal WTP of respondents aged 30 who do not belong to any of the other categories, i.e. who have no children, are non-Basque and are not climbers. The base case is then compared to four groups: older people (aged 60), people with children, climbers and people with a Basque cultural identity. So the base mean marginal WTP to protect Jaizkibel's current landscape, estimated at 0.29 euros, declines to 0.22 euros if the respondent is older, rises to 0.46 if the respondent has children or if has a Basque cultural identity and rises to 1.30 euros if the respondent is a climber. Note that the significant interaction term of CLIMBER and the landscape attribute makes this group's WTP for landscape approximately 350% higher, revealing a much deeper appreciation of this attribute. In the case of the flora, avifauna and seabed attributes, the marginal WTP to protect these attributes is approximately 25% lower if the age of the respondent is doubled and 60% higher for respondents with children, climbers and Basques.

Figure 1. Distribution of WTP to protect the flora attribute (in € of 2006)



These empirical results suggest that older people do not care as much as young people about the future state of natural resources. People with children and climbers show the opposite pattern, suggesting that, on the one hand, people with children are more worried about the future state of the natural resources that their sons and daughters will inherit and, on the other, that climbers have a higher WTP to protect mount Jaizkibel. But more interestingly, the results show that people with a Basque cultural identity have a higher WTP to protect this natural resource, so that when valuing mount Jaizkibel having a Basque cultural identity is as important as having children or being a climber.

6. Conclusions

Back in the seventies, Simon (1978) was already stressing the interdependencies and complementarities between economics and other social sciences: “we have every reason to try to communicate with the other social science, both to find out what we have to say that may be of interest to them, and to discover what they can teach us about the nature of procedural rationality”. Fortunately, much work has been undertaken since then, and social sciences are slowly but firmly coming to work more closely together. This is especially the case in environmental valuation, where the wide use of stated preference methods has necessitated closer collaboration between economists and other social scientists.

Collaboration among social sciences has helped provide a better understanding of the complex psychological processes involved in a valuation exercise. A large number of factors have been identified as influencing human behaviour, many of them independent of the environmental good under valuation. The influence of cultural factors such as cultural identity has been theoretically considered but there is only limited empirical evidence of their existence and magnitude. In fact, a European programme of research of valuation procedures for sustainability policy concludes that in two of the case studies, “it became clear how valuation statements were, in these situations, inseparable from sentiments of collective identity and communal sustainability concerns” (O'Connor 2000).

In trying to fill this gap, this paper provides empirical evidence of the influence of cultural identity on the WTP to protect natural resources using the choice modelling technique. The Basque Country is an attractive case study for two reasons: firstly because of its high ethnic homogeneity, and secondly because the natural environment plays a central role in Basque cultural tradition. We argue that the rationale for this influence may be found not only in Basque cultural stereotypes but, more deeply, in the unconscious roots of the Basque cultural tradition. In fact, the basic influence of nature in Basque culture has been reported by many different disciplines including anthropology, psychology and political science, not only at a conscious level but at a collective unconscious level (Redondo 1983).

The empirical application involves the economic valuation of mount Jaizkibel, a natural area located in the Basque Country. Four attributes were identified in the choice experiment: landscape, flora, fauna and seabed. The results of a random parameter logit model reveal that, on average, individuals would pay approximately 0.3 euros for a one percent protection of Jaizkibel's landscape, flora, avifauna and seabed. A simulated full distribution of the WTP to protect mount Jaizkibel shows that, on average, the marginal WTP to protect these environmental attributes is approximately 60% higher if the respondent has a Basque cultural identity. According to this empirical research, the influence of cultural identity on WTP is as important as being a climber or having children.

To our knowledge, this is the first application that has shown the influence of cultural identity on the WTP to protect natural resources. Our findings have notable methodological and policy implications. On the one hand, failure to take identitary issues into account could entail significantly biased results in benefit transfer applications. The literature on benefit transfer has shown that latent factors such as population characteristics, attitudes and shared experiences influence welfare differences across sites (Johnston 2007). On the other hand, it is shown that policies aimed at conserving natural resources should consider the cultural context in which they will be implemented. A better understanding of the cultural values that prevail in a specific region or country will ultimately help in designing and implementing environmental conservation policies.

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