Designing Adaptive Reuse Strategies for Cultural Heritage with Choice Experiments

Alessandra Oppio, Marta Bottero and Valentina Ferretti

Abstract The introduction of the sustainable development concept in the field of cultural heritage preservation has led relevant changes to traditional interventions on historical buildings and areas. Although the idea of reusing cultural heritage is not new, the emerging concept of adaptive reuse stresses even more the importance of a holistic approach for addressing successful interventions. Selecting among the potential uses the one that could ensure the preservation of physical characters as well as intangible values, fueling economic development, is a challenging policy and design issue. In this context, this paper proposes the use of Choice Experiments to support the design of adaptive reuse strategies for three mostly unused castles in Northern Italy characterized by different states of conservation, accessibility and surrounding territorial context.

Keywords Cultural heritage conservation · Total Economic Value · Stated preferences · Valle d'Aosta castles · Questionnaires

A. Oppio
Department of Architecture and Urban Studies,
Politecnico di Milano, Milan, Italy
e-mail: alessandra.oppio@polimi.it

M. Bottero (✉)
Department of Regional and Urban Studies and Planning,
Politecnico di Torino, Turin, Italy
e-mail: marta.bottero@polito.it

V. Ferretti
Department of Management, London School of Economics
and Political Science, London, UK
e-mail: v.ferretti@lse.ac.uk

S. Stanghellini et al. (eds.), *Appraisal: From Theory to Practice*,
Green Energy and Technology, DOI 10.1007/978-3-319-49676-4_23

1 Introduction

The European Commission's (2014) Communication "Towards an integrated approach to cultural heritage for Europe" underlines the importance of enhancing the intrinsic, economic and societal value of cultural heritage, defining a strong relationship among preservation and sustainable development principles.

The conceptual concurrence among sustainable development paradigm and preservation (Throsby 2001) has led relevant changes in the field of interventions on historical buildings and areas. As a consequence, the idea of adaptive reuse of cultural heritage into accessible and usable places, by respecting its tangible and intangible aspects, seems to be an increasingly promising strategy for achieving a balance among improvements in material and resource efficiency (Environmental sustainability), cost reductions (Economic sustainability) and intrinsic values retention (Social sustainability).

Although different approaches exist to adaptive reuse (see for example the review by Plevoets and Van Cleempoel 2011), it is broadly acknowledged that adaptive reuse is one that respects the building's heritage significance and adds a contemporary layer that provides value for the future (Latham 2000; DEH 2004; Bullen and Love 2011). Adaptive reuse becomes successful when heritage values, physical characteristics, building's and area's potentials have been analysed holistically (Misirlisoy and Günce 2016).

Considering an intervention on historical buildings, the guiding principles of an adaptive reuse intervention can be summarized as follows (Elsorady 2014): adaptation should preserve the intactness of existing buildings involving minimal changes consistent to new uses' requirements); adaptation should retain the symbolic values of historical buildings; adaptive reuse design should follow the sustainability principles; the community engagement is encouraged and, finally, the selection of potential adaptive uses should consider the instance of fuelling larger territorial development processes.

This paper is divided into 4 main sections: the first introduces the role of economic evaluation for supporting cultural policies; the second focuses on the Choice Experiments methodology; the third describes the application of Choice Experiments to three castles located in the Valle d'Aosta Region (Italy); the last one discusses the results and proposes future research lines.

2 Supporting the Design of Alternatives Uses of Cultural Heritage

Cultural heritage enhancement and conservation is generally characterised by high levels of complexity and uncertainty, due to the wide, and sometimes divergent, range of interests and values (i.e. economic, aesthetic, cultural, educational, political) to be considered. Despite the social function assigned to cultural heritage by

the Government, that makes it to be considered as a public good, under the economic perspective the not-rivalry and not-excludable conditions should be verified case by case, as well as the economic feasibility of the preservation interventions (Stellin 1994; Bottero 2011). Being operationally impossible and economically a paradox to preserve the entire cultural heritage (Vecco 2010), the decisions about what and how to conserve for representing us and our past to future generations should be supported by robust evaluation methodologies. The achievement of a balance among goal and instrumental values is still a challenging decision problem. Over the past two decades, several theoretical advancements and methodological proposals have been developed to support cultural heritage evaluation. The money value of cultural heritage is a crucial instance for cultural policy as (1) markets concerning heritage are not able to reflect the value users and society attach to the cultural goods (Mazzanti 2002) and (2) the allocation of public resources requires legitimation, transparency and efficiency.

Although the differences among the operational contexts and the evaluation techniques, there are some common issues: the acknowledgement of different categories of value within the notion of Total Economic Value (Pearce and Turner 1990); the use of stated preference questionnaire-based techniques for estimating the extent of collective willingness to pay for a specific benefit rather than the revealed ones, that are not able to capture use and non-use values; the relevance of including different categories of stakeholders into the evaluation processes.

3 Methodological Background

The term Choice Experiments (CE) refers to a statistical methodology which aims to study individual choices using preferences expressed about various profiles, i.e. several versions of a product or service (Lancaster 1966).

The development of a CE model includes the following steps:

- Definition of a set of attributes or features describing the good, service, project or policy, each taking a number of pre-specified levels.
- Combination of these levels and attributes to build up descriptions of hypothetical bundles, using experimental design techniques.
- Questionnaire for asking individuals to state their preferences over these alternatives, using a number of different protocols. In particular, respondents are asked to choose between different bundles of goods, which are described in terms of their attributes, or characteristics, and the levels that these can take. One of the attribute is usually the price.
- Analysis of the individual responses and prioritization among the different combinations of features. It is assumed that the total worthiness of a particular product choice is determined by the different part utilities (partworths) of each feature level (Sayadi et al. 2005). Responses are then analyzed using statistical models.

As stated by Louviere et al. (2010), CE are based on a well-tested theory of choice behavior called Random Utility Theory (RUT; McFadden 1986) that is able to offer an explanation of the choice behavior of human beings. Among the main strengths of the CE we can recall the possibility of providing a comprehensive conceptualization of the entire system under investigation, the capacity of representing real-world decision making processes, avoiding unfeasible or unrealistic options, and the faculty of considering in a flexible way different protocols of eliciting preferences. For the aforementioned reasons, CE are able to provide a deep understanding of how people make their choices and different applications of the method exist, not only in marketing, but also in other fields of applied economics.

In particular, CE have been mostly used to estimate the value of environmental goods (e.g. Alvarez-Farizo and Hanley 2002; Adamovicz et al. 1998). Few applications exist dealing with the assessment of the value of landscape and cultural heritage. As far as landscape valuation is considered, different applications of CE focus on the economic analysis of rural landscapes (Rambonilaza and Dachary-Bernard 2007; Hanley et al. 1998a, b; Sayadi et al. 2005, 2009; Tagliafierro et al. 2013; Bottero et al. 2015). Other studies consider the implementation of the method for assessing natural and archaeological sites (Kinghorn; Bullock and Collier 2011).

4 Case Study

4.1 The Castles Under Evaluation

In this study CE have been applied to a group of three castles located in the Valle d'Aosta Region. The castles are owned and managed by the Regional government in Valle d'Aosta. Actually, the Regional Superintendence for Cultural Heritage is enhancing a "Restitution" policy, based on the idea of bringing cultural heritage back to local communities, despite the continuous reduction of the available resources for cultural policies (Oppio et al. 2014, 2015). Valle d'Aosta is well known for its rich heritage of defensive architectures: castles and towers dominate the valley, characterizing this territory, which was for a long time a crossing point. Built for defensive purposes, castles gradually lost their original function and today some of them are completely empty and unused, some others have become important attractors for tourism and related activities (e.g. the Castle of Bard in the lower part of the Valley). Among the 13 castles owned by the Region Valle d'Aosta, the study focuses on the ones that are mostly unused: the Chateau Vallaise (Arnad), the Sant-Germain castle (Montjovet) and the Ussel castle (Châtillon). The castles have been analyzed from the point of view of the historical and architectural points of view. In particular, the study took into account different types of data, including different intrinsic features (age, state of conservation, uses and activities) and extrinsic features (accessibility, quality of the landscape, connections to the

mobility system, surrounding functions). These features make it challenging to define the best potential adaptive reuse for the castles.

The first castle is a medieval architecture located in the municipality of Arnad (Fig. 1a). During the centuries, the building has undergone several restorations that significantly modified its structure and appearance and today the castle looks like a XVII century building. The interiors are characterized by prestigious frescos, one of the few examples of Valle d'Aosta Baroque art. The castle is currently under restoration, although it has been made accessible to the public in two special openings in 2011. The Saint-Germain castle is located on the edge of a hill over the valley (Fig. 1b). It has been built between the X and XI centuries by the De Mongioveto family for strategic purposes. Originally constituted by a single 19 m tower, this fortress passed over from owner to owner and for a long time it was owned by the Savoy family. Today Montjovet castle is a ruin. The castle of Ussel is the oldest example of a single block castle in Valle d'Aosta (Fig. 1c). Built in the mid XIV century, it dominates the Châtillon plain. In the XVIII century, the castle began to fall into ruins and in 1983 the owner donated the structure to the Region of Valle d'Aosta. After a restoration intervention that ended in 1999, the castle has been opened during summer and hosted exposition spaces.

4.2 Experimental Design and Questionnaire

As mentioned in Sect. 3, the first step of Choice Experiments deals with the selection of the attributes and the definition of their levels of intensity according to the following methodological requirements: attributes should be clear and not redundant; for each attribute the status quo should be included among the levels; each combination of attributes and levels should define a profile.

In the case study under investigation, attributes and levels have been identified by focus groups with experts in the field of adaptive reuse of historic and architectural resources and with technicians of the Superintendence of the Valle d'Aosta. Consistently with the idea widely shared among the experts involved, that active conservation of cultural heritage represents a kind of prevention from decay and abandon only if it is able to generate economic and financial resources adequate to sustain maintenance activities over time, the following attributes have bee defined (see Table 1):

(1) Multifunctionality, defined as the capability of a building to host different functions or services with a high level of complementarity among them in order to ensure vitality, to avoid periods of disuse, as well as to encourage the transformation of hosted functions with reference to emerging changes of needs;
(2) Conservation, meant as the attention to maintain the structural and material features of the buildings as they have been changed over time. The conservative approach differs from the restorative one for its purpose to not operate

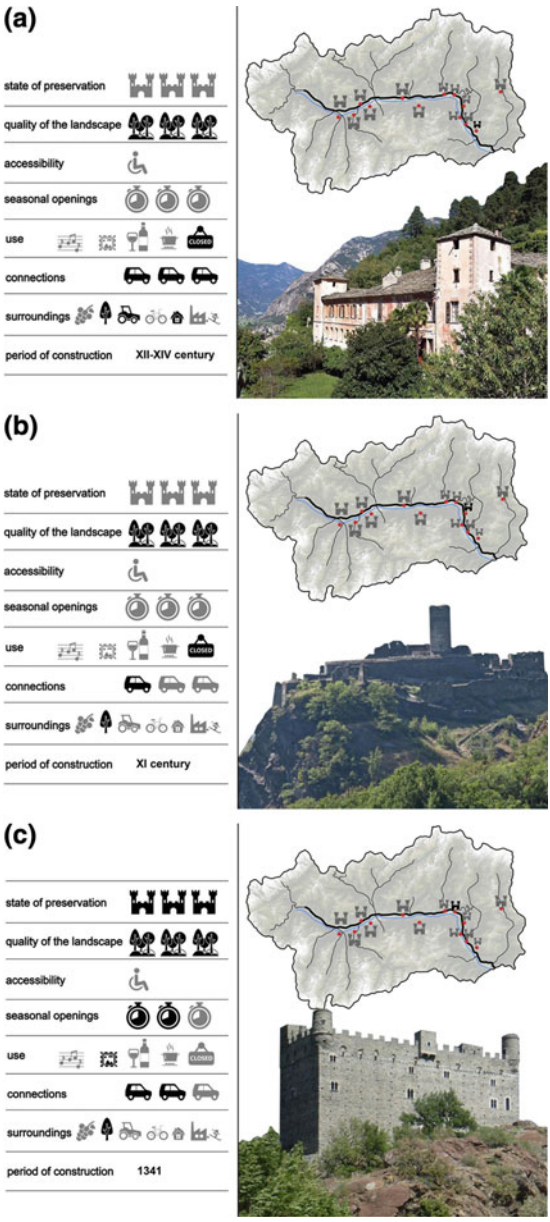

Fig. 1 The three castles under examination: **a** Chateau Vallaise (Arnad); **b** Sant-Germain castle (Montjovet); **c** Ussel. The legend displays the different elements considered in the analysis of the castle, highlighting in *dark grey* the achieved factors and in *light grey* the not achieved factors

Table 1 Attributes and levels

Attributes	Levels		
Multi-functionality	Low: the castle remains unused Medium: presence of one or two different functions High: presence of more than two different functions		
Conservation	Low: the castle remains as it is actually Medium: some portions of the castle are restored High: the castle is totally restored		
Exclusivity	Private: the access to the castle is not allowed except for those authorized Semiprivate: the castle is open according to specific limitations Public: the castle is open and can be visited without limitations		
Interaction	Low: local productions are not considered among the potential functions Medium: the potential functions are indirectly connected with local production High: local products and services are included in the potential functions		
Cost_Inhabitants	Arnad	Monjovet	Ussel
	0 €	0 €	0 €
	30 €	25 €	30 €
	60 €	50 €	60 €
Cost_Tourists	Arnad	Monjovet	Ussel
	0 €	0 €	0 €
	7 €	4.5 €	5.5 €
	14 €	9 €	11 €

irreversible changes to the structure in order to ensure a bequest to future generations;

(3) Exclusivity, referred to the use of the castles. Under an economic perspective public goods are not-excludable, as it is difficult for economic and technical reasons to exclude someone from their consumptions independently from the ownership;

(4) Interaction, that deals with the opportunity to create synergies with the local activities and productions in order to strengthen the population' sense of ownership of the castels and to revitalize the regional economy starting from the castles and their surroundings;

(5) Cost, that is the most probable amount of money for an entrance ticket that tourists would be willing to pay or the most probable annual tax that inhabitants would be willing to pay in order to support investments aimed at enhancing the castle. Consistently with the CE literature (Bullock and Collier 2011; Hanley et al. 1998a, b; Bravi and Giaccaria 2006), the levels of this attribute are defined by a questionnaire administered to a limited sample of respondents. In particular, a pre-test has been carried out with the participation of some experts from the Superintendence, in order to point out the Willingness To Pay for the sub-sample tourists and the sub-sample residents. The cost equal to 0 Euro has been included as it refers to the current situation, where no interventions are developed. Given the differences between the

actual state of conservation and use of the castles under investigation and the proposed ones, different levels of cost have been considered for each of them. The higher levels, both for inhabitants and for tourists, have been assigned to the castles of Arnad and Ussel, as they show a higher suitability to adaptive reuse.

Attributes and levels have been combined by a partial factorial design. Dawes and Corrigan (1974) have shown that on average the main effects explain from 70 to 90% of the variance of the gathered observations while the two-way interactions effects explain instead a varying percentage from 5 to 15%. Therefore, partial factorial design represents a good trade-off between complexity of the questionnaires and accuracy of the results.

The Orthoplan function of SPSS software has been used in order to define a subset of all the possible alternatives according to the orthogonal design rule. More specifically, the Orthoplan function provides a default set having the minimum number of alternatives so that we can analyse the main effects of the individual attributes. It also automatically discards the dominant or dominated alternatives when at least two attributes are numeric or ordinal. The orthogonality of the design avoids the respondents' preferences to depend on a biased construction of alternatives in the questionnaire. In other words, the probability that alternative A is preferred to alternative B must depend solely on the fact that the individual prefers A to B, without being influenced by the fact that alternative A has a higher probability of being extracted by the set of alternatives compared to B (Johnson et al. 2013).

Three of the five attributes described above have been considered as ordinal (Multifunctionality, Interaction and Conservation). Attribute Cost is numeric and attribute Exclusivity is categorical. According to these properties, a subset of eighteen alternatives has been generated, which have been coupled in order to obtain nine choice experiments. In each choice experiment, the status quo alternative has also been included, using the level of the attributes corresponding to each castle's current state (Fig. 2).

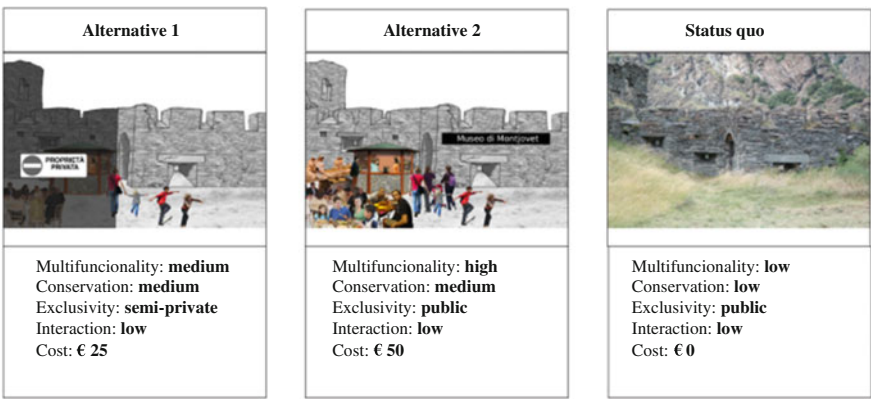

Fig. 2 Example of choice experiment

4.3 Econometric Model

A sample of around 600 respondents (divided into tourists and residents) was surveyed with face to face interviews between August and September 2014. The answers to the CE questionnaire were analysed within the random utility model framework (McFadden 1974). Responses were run through the software SPSS in order to estimate the probability of a given choice being made as a function of its characteristics. Logit regression model was estimated and the results are represented in Table 2.

From the analysis of the estimation coefficients of Table 2, it is possible to formulate some interesting observations. Firstly, the coefficient of the price has a negative sign. This is consistent with economic theory and logic because, if the cost of the option increases, the preference for the option decreases. Secondly, the exclusivity attribute has always a negative sign: this means that respondents tend to appreciate a non-excludable castle (i.e. public property of the cultural assets). Thirdly, it is possible to state that tourists tend to appreciate the state of conservation of the castles more than residents. Fourthly, one of the most important feature for the residents is the multi-functionality.

4.4 Consumer Surplus and Reuse Scenarios for the Castles

Starting from the results of the CE model, the estimated coefficients were used to generate alternative reuse projects for the three castles. In particular, both for the tourists and for the residents, the two most preferred attributes were selected as fundamental elements to be considered in the design of the reuse project for the castles. As an example, let us consider the estimation coefficients of the Arnad castle resulting from the tourist model. These coefficients are highlighted in grey in Table 2. In this case, the highest values correspond to the attribute "Multi-functionality" (regression coefficient 0.910) and "Conservation" (regression coefficient 1.413). The reuse project for the Arnad castle under the tourist scenario

Table 2 Estimation coefficients of the regression model considering the three castles under investigation and the preferences expressed by residents and tourists

	Arnad		Ussel		Montjovet	
	Residents	Tourists	Residents	Tourists	Residents	Tourists
Multi-functionality	0.729	0.910	0.703	0.054	0.601	0.741
Conservation	0.532	1.413	0.396	0.455	0.586	0.501
Exclusivity	−0.567	−0.618	−0.452	−0.53	−0.489	−0.697
Interaction	0.538	0.538	0.619	0.036	0.655	0.234
Price	−0.015	−0.038	−0.016	−0.058	−0.007	−0.061
Const	−2.51	−4.518	−2.712	−0.729	−2.962	−2.281

considers a deep restoration of the building to improve the state of conservation; this project will also focus on the creation of different functions to be developed in the castle, such as small shops, coffees and restaurants, a museum and so on. Following a very similar reasoning, two different projects have been defined for each castle (one for the tourist scenario and the other for the residents scenario), leading to a set of 6 alternative options (Table 3).

The analysis of the data collected with the CE survey can be useful also to assess how much individuals value project concepts. In other words, the coefficients resulting from the CE evaluation reveal the role of the different factors in influencing the final choice. For this purpose, the estimation coefficients of Table 2 are used to evaluate the degree to which the interviewees do trade-offs among the attributes. In particular, from the parameters of the model it is possible to calculate the Willingness To Pay (WTP) or consumer surplus for the specific reuse projects for the three castles.

Equation (1) represents the formula proposed by Harpman (2008) for the valuation of the consumer surplus:

$$WTP = \frac{\ln(1 + e^{\alpha})}{-\beta_{mon}} \tag{1}$$

where α is the sum of the βixi coefficients of the regression model for all the attributes, excluding the price and βmon is the regression coefficient related to the monetary attribute.

As an example, we can consider again alternative 2 related to the Arnad caste under the tourist scenario. In this case, the measure of the consumer surplus can be calculated using Eq. (1) as follows:

$$WTP = \frac{\ln(1 + \mathrm{e}^{(0.910*3 + 1.413*3 - 0.618*1 + 0.538*1 - 4.518)})}{-0.038} = 64.74\,€. \tag{2}$$

In particular, the WTP for alternative 2 is calculated using the values that each attribute takes on under this scenario, namely high multi-functionality (3), high conservation (3), public exclusivity (1) and low interaction (1), and using the estimates provided in Table 2.

5 Discussion and Conclusions

This study proposed the use of Choice Experiments to define proper requalification strategies for three castles located in the Valle d'Aosta Region (Norther Italy). The three castles are owned and managed by the Regional government in the Valle d'Aosta Region which has been significantly involved in the overall planning and decision making process by co-structuring the decision problem and providing preference information.

Table 3 Alternative reuse projects that have been generated from the CE results

Alternatives	1. Arnad residents	2. Arnad tourists	3. Ussel residents	4. Ussel tourists	5. Monjovet residents	6. Monjovet tourists
Attributes	Multi-functionality interaction	Multi-functionality conservation	Multi-functionality interaction	Multi-functionality conservation	Multi-functionality interaction	Multi-functionality conservation
WTP	100.44 €	64.74 €	91.36 €	14.77 €	177.61 €	21.31 €

The study has an innovative value which stems from the context of application of the Choice Experiments approach. As highlighted in Sect. 3, Choice Experiments have been mostly used to estimate the value of environmental goods and only recent applications have explored limits and advantages of this methodological approach for dealing with the economic assessment of the landscape in its own. The study proposed in this paper explores the applicability of Choice Experiments for dealing with an emerging dimension of environmental goods, i.e. cultural heritage in the form of architectural buildings calling for both preservation and renovation, thus representing a challenging context of application.

Another element of innovation brought by this study refers to the use of a formal approach to support the design of alternative solutions for a complex decision making problem. As highlighted in the scientific literature (Colorni and Tsoukiàs 2003; Ferretti 2016), there is indeed a need to investigate more in depth the design phase of alternative solutions since alternatives are rarely given, they are rather constructed through the decision making process. This study showed how the use of Choice Experiments can support the identification of the most relevant features needed for the design and implementation of successful requalification alternatives.

Future developments of the study may explore the integration of Choice Experiments and Multicriteria Decision Aiding techniques for the elicitation of preference information and the evaluation of the designed alternatives according to a mixed methods approach.

References

Adamowicz W, Boxall P, Williams M et al (1998) Stated preference approaches for measuring passive use values. Choice experiments and contingent valuation. Am J Agric Econ 80:64–75

Alvarez-Farizo B, Hanley N (2002) Using conjoint analysis to quantify public preferences over the environmental impacts of wind farms. An example from Spain. Energy Policy 30:107–116

Bottero M (2011) Assessing the economic aspects of landscape. In: Cassatella C, Peano A (eds) Landscape indicators. Springer, Berlin, pp 167–192

Bottero M, Ferretti V, Mondini G (2015) Towards an integrated economic assessment of landscape. In: Gambino R, Peano A (eds) Nature Policies and Landscape Policies. Towards an Alliance. Springer, Berlin, pp 371–380

Bravi M, Giaccaria S (2006) La Conjoint Analysis (CA) nelle valutazioni immobiliari. Aestimum 48:39–59

Bullen PA, Love PED (2011) A new future for the past: a model for adaptive reuse decision-making, Built Environ Project and Asset Manage 1(1):32–44

Bullock CH, Collier M (2011) When the public good conflicts with an apparent preference for unsustainable behavior. Ecol Econ 70:971–977

Colorni A, Tsoukiàs A (2013) What is a decision problem? Preliminary statements. Proceedings of ADT 2013, vol 8176, Lecture notes in artificial intelligence. Springer, Berlin, pp 139–153

Dawes RM, Corrigan B (1974) Linea models in decision making. Psycol Bull 81:95–106

Department of Environment and Heritage (DEH) (2004) Adaptive reuse, Commonwealth of Australia, Canberra. Accessed at https://www.environment.gov.au on Mar 2015

Elsorady D (2014) The economic value of heritage properties in Alexandria, Egypt. J Cult Heritage 15:511–521

European Commission's (2014) Communication "Towards an integrated approach to cultural heritage for Europe. Accessed at http://ec.europa.eu/culture/library/publications/2014-heritage-communication_en.pdf, Dec 2015
Ferretti V (2016) From stakeholders analysis to cognitive mapping and multi-attribute value theory: an integrated approach for policy support. Eur J Oper Res 253:524–541
Hanley N, MacMillan D, Wright RE et al (1998a) Contingent valuation versus choice experiments: estimating the benefits of environmentally sensitive areas in Scotland. J Agric Econ 49(1):1–15
Hanley N, Wright RE, Adamowicz V (1998b) Using choice experiments to value the environment. Environ Res Econ 11(3):413–428
Harpman DA (2008) Introduction to conjoint analysis for valuing ecosystem amenities. technical memorandum EC 2008-01. US Department of the Interior Bureau of Reclamation
Johnson FR, Lancsar E, Marshall D et al (2013) Constructing experimental designs for discrete-choice experiments: report of the ISPOR conjoint analysis experimental design good research practices task force. Value Health 16(1):3–13
Lancaster KJ (1966) A new approach to consumer theory. J Polit Econ 2:132–157
Latham D (2000) Creative Reuse of Buildings 1–2, Donhead Publishing Ltd, Shaftesbury, UK
Louviere JJ, Flynn TN, Carson RT (2010) Discrete choice experiments are not conjoint analysis. J Choice Model 3(3):57–72
Mazzanti M (2002) Cultural heritage as multi-dimensional, multi-value and multi-attribute economic good: toward a new framework for economic analysis and valuation. J Socio-Econ 31:529–558
McFadden D (1974) Conditional Logit analysis of qualitative choice behavior. In: Zarembka P (ed) Frontiers in econometrics. Academic Press, New York, pp 105–142
McFadden D (1986) The choice theory approach to market research. Market Sci 5:275–279
Misirlisoy D, Günce K (2016) Adaptive reuse strategies for heritage buildings: a holistic approach. Sustain Cities Soc 26:91–98
Oppio A, Bottero M, Ferretti V (2014) Multicriteria Spatial analysis for competitive cultural heritage in fringe areas: the case of Valle D'aosta castles, advanced engineering forum, new metropolitan perspective. Integr Appr Urban Sustain Dev 11:579–584
Oppio A, Bottero M, Ferretti V, Fratesi U, Ponzini D, Pracchi V (2015) Giving space to multicriteria analysis for complex cultural heritage systems: the case of the castles in Valle D'Aosta Region, Italy. J Cult Heritage 16(6):779–789
Pearce DW, Turner RK (1990) Economics of natural resources and the environment. Johns Hopkins University Press, Baltimore
Plevoets B, Van Cleempoel K (2011) Adaptive reuse as a strategy towards conservation of cultural heritage: a literature review. WIT Trans Built Environ 118:155–164
Rambonilaza M, Dachary-Bernard J (2007) Land-use planning and public preferences: What can we learn from choice experiment method? Landscape Urban Plan 83:318–326
Sayadi S, Gonzalez Roa MC, Calatrava Requena J (2005) Ranking versus scale rating in conjoint analysis: evaluating landscapes in mountainous regions in southeastern Spain. Ecol Econ 55:539–550
Sayadi S, Gonzàlez-Roa MC, Calatrava-Requena J (2009) Public preferences for landscape features: the case of agricultural landscape in mountainous Mediterranean areas. Land Use Policy 26:334–344
Stellin G (1994) Sviluppo sostenibile locale e risorse storico-culturali: strategie e valutazioni, Atti del XXIV Incontro di Studio Ce.S.E.T., 199–223
Tagliaferro C, Longo A, Van Eetvelde V et al (2013) Landscape economic valuation by integrating landscape ecology into landscape economics. Environ Sci Policy 32:26–36
Throsby D (2001) Economics and culture. Cambridge University Press, Cambridge
Vecco M (2010) A definition of cultural heritage: from the tangible to the intangible. J Cult Heritage 11(3):321–324