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Developing wine tourism experiences. A discrete choice analysis using best-worst scaling data

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Abstract. The aim of this research is to aid winery managers in bundling a plethora of different service features to meet the wine tourists' expectations. A discrete choice model using best-worst scaling (BWS) data is estimated to obtain the relative importance of the attributes included in the analysis. Findings show that the most important aspects that make wineries attractive are: to offer wine tastings and "tour & visits", to provide visitors with wine specialists/tour guides and, finally, to make the surrounding area and natural environment as pleasant as possible. Furthermore, the study highlights that wine tourists' preferences are heterogeneous.

Keywords: wine tourism, Sardinia, choice experiments, Best-Worst Scaling, discrete choice models.

1. INTRODUCTION

Any firm in any sector has to make an effort to fully understand the customer's needs and expectations and to meet them, thus, generating satisfaction and willingness to buy again the product/service and/or to recommend it to others both online and offline.

During the last few decades, wineries around the world have been approaching wine tourism as a valid and effective distribution channel [1], a way to promote the products and to be in close contact with potential customers. Thus, wineries can sustain their national and international sales and market share. Hence, their ability to deeply understand what attracts visitors to wineries and what makes them satisfied has become pivotal both for academia and the industry [2]. According to Victorino et al. [3], the lack of an appropriate combination of the resources with the necessary skills and knowledge impede firms from innovating their products, service and experi-

ences. Innovation is a prerogative that creates value for the customers making them satisfied and loyal [4].

Tseng et al. [5] viewed service innovation as a strategical tool to keep a firm competitive. However, knowledge of consumers' reactions to innovations in traditional and symbolic markets such as wine [6] is still very limited so to anticipate the possible acceptance of such innovations is, in the best of the cases, very risky. Furthermore, especially in wine sector, innovation can be seen as an antagonist of tradition because part of the prior and authentic experience can be in part lost, so such innovation can be a failure in the marketplace [7]. Furthermore, the number of academic studies aimed to investigate which are the main service features that make visitors at wineries satisfied is not such large, tend to apply mostly factor and Structural Equation Model (SEM) analysis [8,9], and tend to ignore Italy [10] despite its relevant role both in term of wine production and wine tourism. Thus, the novelty of the paper is based on two main features: the methodological approach and the case study of Sardinian wine tourism.

Best–worst scaling (BWS) has been found to be an efficient way to elicit taste-based preferences that obtain the key drivers of service provision in different contexts [11]. The method has been applied in different fields such as transportation [12,13]; marketing [14,15]which can be greatly ameliorated by the use of a new technique, best-worst scaling (BWS; health care [16,17]; food industry [18,19]; wine choice in Italy [20]; and tourism [21,22]. Scarpa et al. [22] find that repeated best-worst selection tasks facilitate the cognitive burden of multi-attribute stated preference surveys. Kim et al. [21] contend that BWS has been almost absent in the tourism literature, and it is still unclear why this is the case as there are many topics that could be benefitted from its application. These authors use BWS to identify the most important key drivers that characterize hotel choice under two different scenarios: luxury and economy hotels.

In this paper, the authors transform survey data obtained from the use of traditional semantic scales into a BWS data set with the purpose of analysing the main drivers of customers' preferences for wine tourism. The applied method extracts, from each observation, substantially more information than that obtained by analysing the scores reported by respondents independently. Thus, the present research is an additional case of the scant BWS studies in tourism, and it is expected that the methodology could be applied more frequently in the future since it represents an efficient method to elicit taste-based preferences.

This said, there is a need to deepen our understanding of wine tourism and BWS is an adequate methodo-

logical alternative to achieve this purpose. For this reason, experimental designs to extract BWS datasets, jointly, with advanced discrete choice models estimations are proposed in the study to better delineate the key drivers that develop successful wine tourism products. BWS datasets are free of the biases inherent in traditional response scales and are ideal for handling the comparative evaluation of large amount of indicators which are mostly qualitative in nature [12] (p. 108). This would strongly support wine producers and managers in their attempt to effectively plan and implement their product and service design in ways that their visitors can be satisfied with the visit and prone to return to it and/or to recommend it to others [23,24].

According with existing literature, the product and service design consists of the evaluation of available resources that aims to being innovative and unique [25]. The customer value is obtained through a perfect alignment between the perceived service and the expectations. Hence, wineries need to find the true value drivers differentiating these from those attributes which can be costly to the firm without providing the adequate rate of return. Specifically, wineries need to analyse whether being able to taste the local produced wine, being able to visit the vineyards and the cellar, being able to buy wine, being able to be accommodated, among others, are true value drivers.

Based on the literature review, the paper proposes to design the high-valued winery tourism products based on 29 different attributes used to describe the main operational capabilities of wineries, such as tangible product characteristics, staff attributes and other more affective and emotional attributes. Hence, the aim of this research is twofold. First, it aims to analyze the degree of importance of different attributes that could be considered by visitors when selecting a wine tourism destination. Secondly, it aims to ascertain whether socio-demographic characteristics of visitors (gender, age, place of residency) and travel-related variables (prior experience with visitation at wineries and length of stay) influence their assessment.

To achieve these aims, the study data collected in the period June-September 2015 from a sample of 271 visitors at wineries in the Island of Sardinia (Italy) were used to generate a discrete choice BWS dataset after creating an appropriate experimental design. This allowed us to estimate different choice models in order to obtain the relative importance of the attributes included in the analysis. The flexibility of the modelling strategy followed also enabled us to draw interesting conclusions regarding the heterogeneity in wine-tourists' preferences, which contrast with the traditional method based on the

analysis of sample average scores. Our results provide interesting managerial implications that can be used for promoting wine-tourism in the region.

2. LITERATURE REVIEW

Wine tourism has been previously defined by Charters and Ali-Knight [26] and Getz and Brown [27]. Recently, Sousa [28] extends the definition given in [27] as a simultaneous form of consumer behavior, a destination strategy that develops and markets wine-related attractions, and a marketing opportunity for wineries to educate and to sell wine-related products directly to consumers. Prospective on wine tourism needs to rely on new product development process [29] that consists of six major steps: (1) idea generation; (2) screening; (3) business analysis; (4) concept development; (5) final testing; and (6) commercialization. The current study mainly deals with the fourth step. Ottenbacher and Harrington [30] show that there is a connection between the use, the process and the likelihood success increase. Hjalager [31] contends that the process can also act as a catalyst for improving existing services that increase the product perceived value.

Gómez et al. [32] perform a systematic review of wine tourism research over the period 1995-2014 and found eight different topic areas: (1) wine tourism development; (2) winery and cellar door; (3) wine tourist behavior; (4) wine events and festivals; (5) marketing and promotion; (6) critical success factors; (7) wine tourism models; and (8) education and other. The two most researched topics were wine tourism development (35%) and wine tourist behavior (26%). A further analysis of subtopics revealed that regional development and market segmentation of wine tourists are the most relevant with shares of 19 and 17 percent respectively. Notwithstanding, it seems obvious that these two subtopics are highly related.

Charters and Ali-Knight [26] contend that wine tourism development and market segmentation is usually based on important behavioral aspects of wine tourists such as motivations, expectations and experiences. Quintal et al. [33] further include the push-pull winescape indicators of the hedonic experience to generate a segmentation basis for cluster analysis. In this sense, it is important that push factors could also include travel constraints and impediments. For example, Cho et al. [34] comment that wine tourism market segmentation have not adequately addressed the issues related to travel constraints, barriers or impediments that some tourists might have to not visit wineries. This is an important aspect for which wine tourist destination marketing campaigns can be misleading.

Alebaki and Iakovidou [35] compared a number of approaches that have been used to find market segments in wine tourism, analyzing the main indicators included, and found that the psychographic scales are mainly based on the following motivations and wine lifestyles: (1) needs-based motivations, value-based motivations, benefits and expectations; (2) push-pull factors; (3) core wine product, core destination appeal and cultural product; (4) purpose of the winery visit; and (5) wine lifestyles that include wine interest, wine cellaring behavior and wine club participation. Similarly, Molina et al. [36] summarized the psychographic scales as: (1) interest in wine; (2) interest and knowledge in wine; (3) interest in wine and motivation; (4) motivations; (5) sensation seeking; (6) attitudes and behavior; (7) values and lifestyle; and (8) constraints framework.

Festa et al. [37] contend that although wine tourism in Italy is recently achieving recognition in the world, there is still a number of lags on institutional, managerial, and professional developments that impede some Italian destinations of getting its full potential. Wine tourism is offering new niche markets for cellars that can foster micro tourist destination competitiveness [38–40]. The potential synergies between these two industries are gaining the academic attention as a particular region tourism attractiveness can be increased with wine and food products promotion [1,41–43].

Wine tourism products share some commonalities with other agricultural products regarding the perceived value for its provenance associated cultural stories and lineage [44]. The authenticity can be molded by the peculiarities of the grapes type, the blending process, the winescape, the traditions, the feasts, and the ethnography associated to winemakers and growers. The development of wine tourist products and its marketing need to be addressed by well-grounded quantitative studies that help wineries and destination marketers in achieving a successful and innovative product.

Winescape was defined by Peters [45] as "the winsome combination of vineyards, wineries, and supporting activities necessary for modern wine production, [which] yields regions that offer sojourners and dwellers alike a certain charm – a warm ambience, a memorable experience of place – not found in most other agricultural landscapes' (p. 124)." The definition lacks concretion on the supporting activities that can be pursued in experiencing the place. Since the seminal winescape definition, a lot of studies have analyzed wine tourism using winescape scales [46–49].

Regarding the methods that have been used to analyze wine tourism development and market segmenta-

tion, as usual in social science, the literature abounds in qualitative, quantitative and mixed methods. Within the category of qualitative studies, we highlight here the work by Frost et al. [44] that uses interpretivism as way to conduct the exploratory analysis. This method consists in putting researchers in the shoes of the interviewees in order to better extract the experiences and opinions on the main attributes of winescape. The authors find that a representative sample of wineries in south east Australia uses heritage as a key marketing component. The heritage concept is promoted via family history, ethnicity, 19th century buildings and vineyards.

Within the category of quantitative methods, cluster analysis is the most popular approach [9,50,51]. For example, Bruwer et al. [50] analyze the relationship between motivations and destination image perception, and find that the visitors can be segmented in five and three different clusters for motivations and destination image, respectively. The wineries are located in in Barossa Valley –South Australia. The motivation clusters are named as wine learners, dining enthusiasts, wine buyers, wine enthusiasts and wine connoisseurs. Curiously, the authors do not name the destination image clusters. Meanwhile, Gu et al. [9] identify four different clusters regarding the involvement level of Chinese tourists who participate in wine tourist routes in Australia, namely, low involvement, highly involved, interest-driven and high-risk perception. And finally, Priilaid et al. [51] perform a cluster analysis to analyze the visitors' interest and engagement in wine consumption and wine education in South Africa's Cape Region. The authors find three clusters, namely, enthusiasts, consumers and explorers.

Other methods, besides the mentioned cluster analysis, that have been used to obtain market segments in wine tourism are the following: tourists' self-classification on the basis of their interest in wine and the knowledge about it [26]; Multiple Correspondence Analysis (MCA) applied to wine tourists' motivations [52]; and latent class segmentation analysis based on interest in wine, motivations and demographic characteristics of tourists [36].

Discrete choice is not as popular as cluster analysis in the research of wine tourism. In a recent literature review, Boncinelli et al. [53] find 35 studies that use choice experiments to analyze consumers' wine preferences. Out of the 35 studies, none of them analyze the consumers' wine preferences in a context of wine tourism. In addition, the category 'occasion' that is the special or usual consumption situation does not include tourism as one of the possible situations, instead more general situations such as at home or with friends are included in the analysis. This fact is very unusual as

wine industry can be considered as a mix of commodity supply, cultural or lifestyle experience, and hospitality or tourism destination [54].

This section ends with the study by Tafel and Szolnoki [55] in which the mixed-methods framework is applied for the first time in wine tourism to a sample of German wineries. The authors conclude that wine tourism is especially successful for those wineries which are located near to large cities. In Germany, wine tourism should reinforce the cultural heritage preservation and strength the economic cohesion of some disadvantaged rural areas. The authors present the mixed-methods approach as more convenient than a quantitative method because of its flexibility to determine the main challenges that wineries are facing. Interestingly, the most important key personal challenge to participate in wine tourism is the lack of human resources which increases the owner workload and labor fatigue.

3. DATA AND METHODOLOGY

3.1 Survey and sample description

The study is based on a questionnaire that was structured into two sections. In the first one, respondents were asked to provide general information about their socio-demographic profile (age, gender, level of education, etc.). The second section asked individuals to assess the extent to which 29 different attributes are important for them when deciding to undertake a wine tourism-related experience at a winery (5-point ordinal scale: 1=not at all important, 5= extremely important). The items were sourced from prior studies [27,56,57].

The questionnaire was originally designed in English and then translated into Italian, French and German. Based on existing literature, different possible methods of translation exist [58]. This study opted for a back translation approach, which is a common approach in tourism-related settings [59]. Hence, the original English questionnaire was translated by bilingual speakers for each language; a translation back to the original language was then performed by other bilingual speakers. This method of back-translation was used for quality assurance, as the target of this research is an international audience.

Once the survey was designed, a pilot study was conducted by two trained students who interviewed face-to-face a sample of 40 visitors at the end of their visit at one of the several Sardinian wineries that kindly agreed to collaborate in the study (15 wineries spread around the overall region). Based on the pilot study small changes were done to further improve the read-

ability and comprehension of some statements included in the survey.

The final data collection was then run face-to-face by 4 interviewers who intercept potential respondents at the end of their visit at the winery for only 10 specific wineries which were selected given the similar characteristics they have, medium and high involvement in wine tourism activities such as guide tours, wine tasting and information brochures. One of the researchers responsible for leading the research team trained the interviewers about when and how to approach visitors and how to support them in filling the survey without interfering in their assessment. Specifically, the interviewers were asked to collect data on different days and time spans of the week intercepting all the visitors and offering them the possibility to voluntarily take part in the study (no prize and/or incentive was offered). The data collection was conducted in the period June-September 2015 and a convenience sample of 271 complete questionnaires was finally obtained.

Table 1 shows the socio-demographic profile of respondents. Overall, it can be seen that the profile of the respondent is characterized by being female, 26-35 years old, non-resident in Sardinia, a frequent visitor to the island, and staying a week or less for the vacation.

Table 1. Socio-demographic profile of the wineries visitors.

Variable	Category	N	Percent
Gender	Male	125	46.13
	Female	143	52.77
Age	<=25	26	9.59
	26-35	73	26.94
	36-45	59	21.77
	46-55	57	21.03
	56-65	23	8.49
	>=66	16	5.90
Sardinia Residence	Resident	74	27.31
	Non-resident	197	62.96
Visits	1	13	4.80
	2	33	12.18
	3	29	10.70
	4	19	7.01
	5	24	8.86
	6-9	12	4.43
	10 or more	55	20.30
Vacation length	<=7 days	84	31.00
	8-14 days	59	21.77
	15-21 days	44	16.24
	>=22 days	18	6.64

3.2 Generation of a choice data set from survey data

In order to analyze which attributes are considered more/less important when deciding to undertake a wine-tourism related experience at a winery, the assessment provided by the 29 attributes included in the survey (see Table 2) was used to generate a best-worst scaling (BWS) case 1 choice data set [60]. For this, we created an efficient choice experiment consisting of 58 choice sets of 4 attributes each. The experimental design was created with the software Ngene [61]. In this regard, it is important to note that for 29 attributes, it is not possible to build a balanced incomplete block design (BIBD) because no solution can be found for those cases where the necessary conditions of design parameters are met [11].

For each particular choice set in the experiment, the most important attribute (best option) was considered the one that obtained the highest score in the survey. In the same fashion, the least important one (worst option) was that with the lowest score. In case two or more attributes were rated with the highest/lowest score, the most/least important one was selected randomly. Also, when obtaining the least important attribute, the one considered the most important, was removed from the choice set. Following this procedure, we were able to generate, for every respondent, a total of 116 choice observa-

tions (58 for most important and 58 for least important responses) which provide valuable information regarding how the individual makes trade-offs among different attributes. This makes a total of 31436 choice observations that will be used during the estimation process to determine the relative impact of each attribute on the overall importance function. The typical BWS choice question as presented in Figure 1 corresponds to the first choice scenario in our experiment. Hence, if a respondent gave the scores of 2,4,5, and 3 to the attributes shown in this choice set, the best choice (i.e. the most important one) was assigned to that showed in the third place, whilst the worst one (i.e. the least important) to that showed in the first place, considering the three remaining options. In the example of Figure 1, the information provided by the respondent in the importance table is transformed in the choice task indicating that the attribute shown in third place is more important than those presented in the first, second and fourth position. Additionally, the attributes shown second and fourth are considered more important than the one presented first. Therefore, the information extracted from the translation of the answers given for the importance of the 29 attributes was transformed in each of the choice tasks included in the whole set of the 58 choice tasks.

Table 2. Attributes included in the analysis.

Number	Name
1	To be able to taste the wines produced at wineries
2	Being able to visit wineries
3	The visiting hour of the wineries are long/extended
4	Being able to buy the wines produced at the wineries
5	Having wine specialists take care of you during visits
6	The existence of specific gastronomic activities
7	The existence of a varied gastronomic offer
8	The possibility of eating at the wineries
9	The existence of organised trips (lodging, visit, tasting, etc.)
10	The existence of specific lodging
11	The existence of sports activities in the area
12	The appeal of the natural environment in the area
13	The existence of organised wine tourism trips
14	The area to be visited is famous for its wines
15	The fame of the wine in the region
16	The existence of well-defined wine routes in the region
17	The climate of the area
18	The existence of specific gastronomic activities
19	The existence of a varied gastronomic offer
20	The possibility of participating in cultural tourism in the area
21	The existence of stores/open-air markets for agricultural products from the area
22	The existence of stores/open-air markets for artisan products from the area
23	The possibility of taking wine tasting courses
24	Being able to increase my knowledge of wine
25	The possibility of participating in wine production activities
26	Meeting the winery owners
27	The existence of activities for children
28	The existence of wine museums or exhibitions
29	The existence of leisure/wine therapy activities

Efficient choice experiments represent the appropriate tool to obtain choice data sets that enable reliable parameter estimates with smaller sample size. This is a very convenient method as, normally, the number of tasks required to obtain all combinations of attributes is unfeasibly large. Efficient designs are based on the minimization of some efficiency measure, typically the D-error, which is derived from the asymptotic variance-covariance matrix and some prior information about the parameter estimates [62]. In our case, parameter priors were obtained from the estimation of a multinomial logit model that used a data set generated in the same fashion described above, but considering, for each respondent, 50 sets of 4 attributes were selected at random.

Which attributes, from the list below, do you consider most and least important in the selection of a wine tourism destination?		
Most important		Least important
☐	The existence of specific lodging	☐
☐	The existence of well-defined wine routes in the region	☐
☐	The existence of activities for children	☐
☐	To be able to taste the wines produced at wineries	☐

Figure 1. Best-Worst choice scenario.

The design obtained is characterized by twenty-four attributes appearing eight times in the choice questions, three appearing seven times, one appearing nine times, and one appearing ten times. The number of times each attribute is paired with each other is cero in 32% of the pairs, one in 52% of the pairs and two in 16% of the pairs.

It is worth noting that Figure 1 was not really presented to respondents, and it is simply used for the ease of exposition of the approach used to construct BWS data using the information provided in the table of importance for the 29 attributes included in the survey. The degree of similitude between results obtained from applying the described method and those obtained when individuals face real best-worst tasks must be empirically tested. Unfortunately, this comparison is not possible in this study, as the survey was not prepared to include a best-worst choice experiment. Therefore, the analysis of the robustness of the method proposed is out of the scope of the current study and is left for future research.

4. THE ECONOMETRIC MODEL

Once survey data were transformed into choice data, it is possible to build a discrete choice model under the random utility maximization framework [63]. In our case, the alternative j makes reference to the position within the choice task. (first, second, third and fourth). Thus, the utility U_{jks} for the importance question associated with the alternative j for individual q in choice task s is represented by:

$$U_{jks} = \alpha_j + \sum_{k=1}^{K} \beta_k D_{jqsk} + \varepsilon_{jqs} \qquad (1)$$

Where α_j is the alternative specific constant that accounts for not measured effects; β_k is the marginal utility or the importance, in this case, associated to the

kth attribute; D_{jqsk} is a dummy variable taking the value 1 if the attribute k is present in alternative j for individual q in choice scenario s and 0 otherwise; and ε_{jqs} is a vector of random terms independently and identically distributed type I extreme value, yielding a standard Multinomial Logit Model (MNL). As in this case we have 29 attributes, only K=28 dummy variables are generated, and the attribute represented by the statement 29 is used as the reference attribute. Thus, in the first choice scenario (s=1) presented in Figure 1, the attributes number 10, 16, 27 and 1 are included in the first, second third and fourth alternatives, respectively. In this regard, for example, in the utility of the first alternative (j=1) for individual q, D_{jqsk} will be equal to 1 for k=10 and 0 for $k\neq10$. Data from least important tasks are simply generated by coding variables D_{jqsk} as -1 if the attribute is present in the alternative and 0 otherwise. Note that the minimum utility option is obtained after the maximization of the negative of the utilities of the remaining options, once the most preferred alternative (i.e. the most important attribute) is removed from the choice set.

We will further assume that the marginal utilities corresponding to most and least important tasks are identical, except for scale differences. In order to account for this potential differences, a scale factor term is included in equation (1), yielding:

$$U_{jks}=\exp(\lambda_w W)(\alpha_j+\sum_{k=1}^{K}\beta_k D_{jqsk})+\varepsilon_{jqs} \tag{2}$$

Where, W=1 if the observation comes from a worst choice task.

The modelling approach is based on that used by [12] when analyzing the importance and satisfaction of public transport attributes in Australia.

Considering that a choice scenario s has J alternatives, the probability that alternative i is chosen as best and r, $r\neq i$ is chosen as worst for individual q in choice scenario s is:

$$P_{qs}^{ir} = \frac{e^{V_{iqs}}}{\sum\limits_{j=1}^{J} e^{V_{jqs}}} \cdot \frac{e^{-V_{rqs}}}{\sum\limits_{\substack{j=1 \\ j\neq i}}^{J} e^{-V_{jqs}}} \tag{3}$$

Where V is the systematic component (i.e., the non-random term) of the utility in equation (2). This model assumes that best-worst choices are made sequentially and is referred in the literature as best then worst MNL model [64]. The model also assumes that the utility of an alternative in selecting the worst option is the negative of the utility of the same alternative in selecting the best option, except for potential differences in scale.

One of the main drawbacks of the MNL model is the inability to analyze random taste heterogeneity in the population. Thus, model parameters are interpreted as point estimates of the marginal utilities for a homogenous population.

Models of the family of Mixed Logit [65] allow for the analysis of the random taste heterogeneity by specifying random coefficients in the utility function. For the purpose of our analysis, the normal distribution was considered. Thus, coefficients in expression (1) are expressed as $\beta_k=\mu_k+\sigma_k\eta_k$, where μ_k and σ_k are parameters to estimate, representing the population mean and standard deviation, respectively; and η_k is a Standard Normal distributed random variable. Systematic heterogeneity in the population parameters can also be accounted for by specifying interactions with some set of covariates V_r, such as socio-demographic and contextual variables. In our case the heterogeneity in mean is considered. Hence, coefficients are expressed as $\beta_k=\mu_k+(\sum_r\mu_{kr}V_r)+\sigma_k\eta_k$ where μ_{kr} are parameters to estimate, characterizing the heterogeneity in mean of the random coefficient in the population.

As we were focused in analyzing how the visitors profile could affect the perception of the different attributes, some socio-demographic variables, as well as character-

Table 3. Covariates used in the analysis.

Name	Variable	Scale
V1	I am interested in wine and in the activities related to it	likert 1-5 1= strongly disagree,… ,5=strongly agree
V2	The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	likert 1-5 1= strongly disagree,… ,5=strongly agree
V3	I frequently read magazines that are specialized in wines	likert 1-5 1=strongly disagree,….,5 strongly agree
V4	Gender	1 male, 0 female
V5	Age	1 = "<= 25"; 2 = "26-35"; 3 = "36-45"; 4 = "46-55"; 5 = "56-65; 6 = ">= 66"
V6	Prior experience	1 First visit, 0 otherwise
V7	Length of stay	1 = "<= 7 days"; 2 = "8-14 days" 3 = "15-21 days" 4 = "=>22 days"
V8	Place of residency	1 Resident in Sardinia, 0 otherwise

istics of the visit, and the interest in wine related activities were included in the set of covariates. The final list of variables used in our models is presented in Table 3.

5. ESTIMATION, RESULTS AND DISCUSSION

During the modelling process, different discrete choice models were built. In a first stage, two multinomial Logit models were estimated. The first (MNL1) considers the utility specification defined in (1). In this case best and worst choices are treated identically. In the second one (MNL2), a scale factor for worst choices is estimated, according to equation . As can be inferred from the estimates presented in Table A1 in the statistical annex, all parameters resulted significant at the 99% confidence level, with the only exception of that of the attribute 27 "*The existence of activities for children*". It is worth noting that this result should not be interpreted as this attribute is not considered important by the winery visitors, but rather its value is not significantly different from the base statement "*The existence of leisure/ wine therapy activities*", that is coded as 0. In the same fashion, positive and negative estimates are interpreted as being more and less important that those equal to 0, respectively.

In order to facilitate the comparison of our estimates with the average score obtained for each item, results were re-scaled between 0 and 1 by considering the difference between each estimate and the minimum value and dividing the result by the value range. As can be inferred from results presented in Table 4, the top and bottom 5 rated items coincide in the same set of attributes, independently on the method used. Thus, the attributes considered more important lie among the group 1,2,4,5, and 12, which are more related to the visit to winery; whilst the less important ones lie in the group of attributes number 10,11,27,28 and 29, which are referred to the existence of certain type of facilities in the area.

A different method to avoid the confounding effect due to differences in scale is the obtaining of the share of preference, SP_k, for each attribute k. They predict the probability that each attribute is chosen as the most important using the following expression [66]:

$$SP_k = \frac{e^{\beta_k}}{\sum_{r=1}^{K} e^{\beta_r}} \qquad (4)$$

The share of preference for the attributes considered in the analysis are presented in Table 4. It is worth noting that this normalization method yields the same

ordering of the attributes than the previous re-scaling method.

Even considering that results are rather similar, there exist differences in the rank order obtained by the average score method and the multinomial logit models, as can be seen in the spearman correlation matrix presented in Table 5, where the highest discrepancy is obtained for the average score and the MNL1 model. In this respect, it is important to point out that this analysis is not based on data obtained by a really best-worst survey where individuals evaluate each item in comparison with the other ones presented in the choice set. Therefore, this potential source of differences provided by the relative comparison of the attributes is not considered in our analysis. These differences have been manifested in similar analyses carried out by other authors in other context [12].

An important advantage of using discrete choice modelling is the potential of this methodology to deal with preference heterogeneity [67]. Thus, in the second stage of the modelling process, different random parameter logit models were tested in order to determine the group of attributes that were heterogeneously perceived by the population. In this regard, after testing different specifications, the coefficients of attributes number 2, 4, 5, 12, 17 and 22 were found to be random, following the Normal distribution. These attributes are: Being able to visit wineries, being able to buy the wines produced at the winery, having wine specialists take care of you during visits, the appeal of the natural environment in the area, the climate of the area and the existence of stores/ open-air markets for artisan products from the area. The heterogeneity found for these attributes have important managerial implications that will be discussed below. To further explore other sources of heterogeneity, the means of these random coefficients were interacted with some of the covariates presented in Table 3.

The estimation results corresponding to the model with the better fit are presented in Table A2 in the annex. The majority of the estimates resulted significant at the 95% confidence level. The only exceptions were the fixed coefficient for attribute 27 ("*The existence of activities for children*") and the interaction of the mean for the coefficient of attribute 5 ("*Having wine specialists take care of you during visits*") with covariate V7 ("*Vacation length*"). The sign obtained for these interaction terms help us to interpret the meaning of the heterogeneity in the population mean for these random coefficients. The statements presented in Table 6 summarize this interpretation. Thus, for example, the importance of attribute 2 "*being able to visit wineries*" is higher for males (note that the coefficient μ_{D2*V4} for the interaction term D2*V4

Table 4. Re-scaled results and share of preference. Multinomial Logit models.

	Attribute	Average score	MNL1	MNL2	Share of preference MNL1	Share of preference MNL2
1	To be able to taste the wines produced at wineries	1.000	0.966	0.978	0.076	0.089
2	Being able to visit wineries	0.890	0.997	0.986	0.083	0.092
3	The visiting hour of the wineries are long/extended	0.625	0.763	0.796	0.042	0.042
4	Being able to buy the wines produced at the wineries	0.891	1.000	1.000	0.084	0.097
5	Having wine specialists take care of you during visits	0.844	0.919	0.945	0.066	0.077
6	The existence of specific gastronomic activities	0.639	0.692	0.736	0.034	0.032
7	The existence of a varied gastronomic offer	0.570	0.623	0.693	0.028	0.027
8	The possibility of eating at the wineries	0.473	0.545	0.618	0.022	0.020
9	The existence of organised trips (lodging, visit, tasting, etc.)	0.448	0.618	0.662	0.027	0.024
10	The existence of specific lodging	0.390	0.503	0.568	0.019	0.016
11	The existence of sports activities in the area	0.000	0.000	0.000	0.004	0.002
12	The appeal of the natural environment in the area	0.697	0.851	0.878	0.054	0.058
13	The existence of organised wine tourism trips	0.493	0.572	0.638	0.024	0.022
14	The area to be visited is famous for its wines	0.405	0.642	0.681	0.029	0.026
15	The fame of the wine in the region	0.502	0.624	0.683	0.028	0.026
16	The existence of well-defined wine routes in the region	0.485	0.585	0.627	0.025	0.021
17	The climate of the area	0.485	0.699	0.719	0.034	0.030
18	The existence of specific gastronomic activities	0.503	0.712	0.729	0.036	0.031
19	The existence of a varied gastronomic offer	0.533	0.709	0.724	0.035	0.031
20	The possibility of participating in cultural tourism in the area	0.572	0.634	0.676	0.028	0.025
21	The existence of stores/open-air markets for agricultural products from the area	0.525	0.729	0.760	0.038	0.036
22	The existence of stores/open-air markets for artisan products from the area	0.485	0.648	0.710	0.030	0.029
23	The possibility of taking wine tasting courses	0.512	0.509	0.612	0.020	0.019
24	Being able to increase my knowledge of wine	0.661	0.678	0.741	0.032	0.033
25	The possibility of participating in wine production activities	0.599	0.719	0.763	0.037	0.036
26	Meeting the winery owners	0.550	0.619	0.700	0.027	0.028
27	The existence of activities for children	0.115	0.344	0.416	0.012	0.009
28	The existence of wine museums or exhibitions	0.339	0.459	0.541	0.017	0.014
29	The existence of leisure/wine therapy activities	0.140	0.323	0.393	0.011	0.008

Top 5
Bottom 5

Table 5. Spearman correlation matrix.

	Average score	MNL1	MNL2
Average score		0.85	0.90
MNL1			0.98
MNL2			

is positive), decreases as the age of the visitor increases (μ_{D2*V5} is negative) and decreases as the individual agrees more with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia" (note that μ_{D2*V2} is negative). The other interaction terms can be interpreted in the same fashion.

A similar interpretation can be done if the focus is put on the different covariates. In this regard, the higher agreement with "I am interested in wine and in activities related to it" (i.e. an increase in V1) impacts negatively upon the importance of "*The climate of the area*" and "*The existence of stores/open-air markets for artisan products from the area*". A negative impact on the importance of climate is also appreciated for those with a higher agreement with "I frequently read magazines that are specialized in wines" (V3). Also, a higher agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia" (V2) reduces the importance given to "*Being able to visit wineries*", "*Being able to buy the wines produced at the wineries*", "*Having*

wine specialists take care of you during visits" and "*The appeal of the natural environment in the area*"; and in contrast, increases the importance given to "*The climate of the area*" and "*The existence of stores/open-air markets for artisan products from the area*". This group of individuals seems to be sufficiently motivated to travel to Sardinia simply by the fact of being able to visit the wineries and not so much by the services and activities offered inside them.

Regarding the socioeconomic profile, males and older people (V4 and V5) tend to put more importance on "*Being able to visit wineries*", as well as on "*The climate of the area*"; and males give less importance to the "*The existence of stores/open-air markets for artisan products from the area*".

The increase in the duration of the holidays (V7) and being a resident in Sardinia (V8) impact both neg-

atively on the importance of "*Having wine specialists take care of you during visits*"; and a longer holiday also reduces the importance of "*The existence of stores/open-air markets for artisan products from the area*".

The estimation of random coefficients in mixed logit models allows for the application of Bayesian statistics to obtain individual level parameters for these random coefficients [65]. The graphs, depicted in Figure 2, represent the kernel density estimates for the distribution of the marginal importance of these random coefficients, with the corresponding confidence interval. In all cases, the distributions present a moderate dispersion, confirming the existence of random heterogeneity in the perception of the attributes, being this higher for the upper bound distributions of the confidence intervals.

Finally, and in order to compare these results with those obtained for the MNL specifications, the share of

Table 6. Interpretation of the heterogeneity in mean.

The mean of the importance of	Being able to visit wineries	decreases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
		increases	for	males	
		decreases	as	age	increases
The mean of the importance of	Being able to buy the wines produced at the winery	decreases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
		increases	for	those who are from Sardinia	
The mean of the importance of	Having wine specialists take care of you during visits	decreases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
		decreases	as	vacation Length	increases
		decreases	for	those who are from Sardinia	
The mean of the importance of	The appeal of the natural environment in the area	decreases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
The mean of the importance of	The climate of the area	decreases	as	the degree of agreement with "I am interested in wine and in the activities related to it"	increases
		increases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
		decreases	as	The degree of agreement with "I frequently read magazines that are specialized in wines"	increases
		increases	for	males	
		increases	as	age	increases
The mean of the importance of	The existence of stores/ open-air markets for artisan products from the area	decreases	as	the degree of agreement with "I am interested in wine and in the activities related to it"	increases
		increases	as	the degree of agreement with "the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia"	increases
		decreases	for	males	
		decreases	as	vacation Length	increases
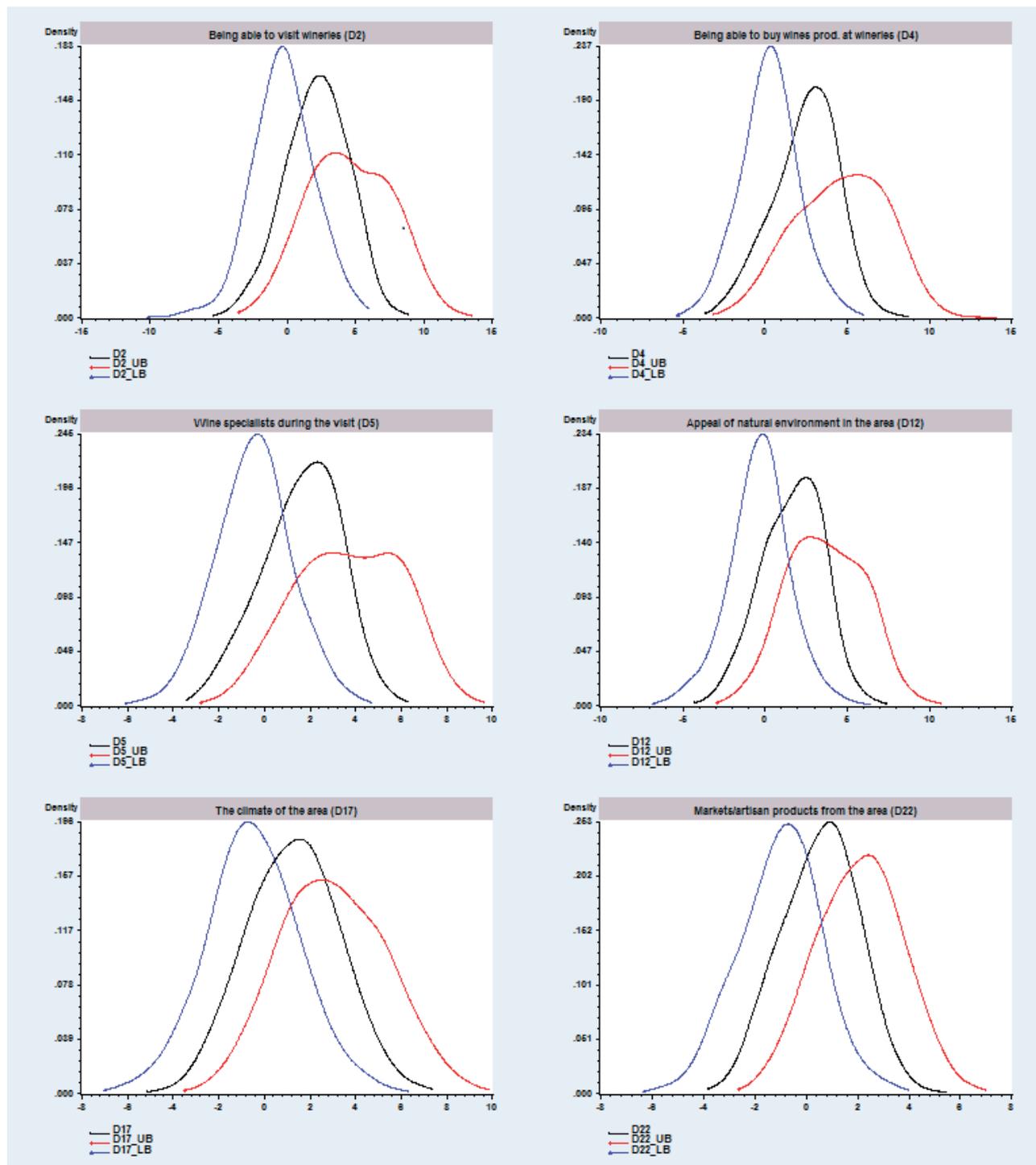
Figure 2. Distribution of random coefficients. Kernel density estimates.

preferences has been obtained for the random parameter Mixed Logit model.

In this case, as we have obtained individual-specific posterior estimates for the mean and standard deviation of the random coefficients, the share of preference has been obtained at the individual level using the posterior mean of the parameter (conditional on individual current choices) for each individual and then averaging the

results in the sample. Results presented in Table 7 are very similar, in terms of the rank order of importance, to those obtained for the MNL models yielding high Spearman correlation values (0.95 for MNL1 and 096 for MNL2).

5.1 Managerial implications

The previous literature on wine tourism agrees in that to effectively develop wine tourist products is necessary to analyze visitors' preferences regarding the attributes that conform the wine tourism experience, as well as the individual factors that foster or limit the participation on the market. Despite interest in wineries research has increased, insights into the importance of the attributes that drive more successful tourist products

need to be further deepened. This is particular evident when the specific context of Italy is considered; in fact, despite Italy can be considered one of the world countries with more well-known wine tourism destinations, the number of studies that analyze the wine tourism markets in Italy is not aligned with the number of existing wineries that offer wine tourist products [68]. This study was therefore carried out to extend the existing knowledge on how to develop this type of products taking into account the important heterogeneity that exists.

Overall, our findings show that there are six attributes that are estimated as random parameters which serve to conclude that there exist heterogeneous market segments that need to be further scrutinized in order to develop satisfying wine tourist experiences. The six attributes are: (1) being able to visit wineries; (2) being

Table 7. Share of preference. Random parameter Mixed Logit model.

Attribute		RP Mixed Logit Model
1	To be able to taste the wines produced at wineries	0.1003
2	Being able to visit wineries	0.1385
3	The visiting hour of the wineries are long/extended	0.0371
4	Being able to buy the wines produced at the wineries	0.1355
5	Having wine specialists take care of you during visits	0.0561
6	The existence of specific gastronomic activities	0.0304
7	The existence of a varied gastronomic offer	0.0216
8	The possibility of eating at the wineries	0.0142
9	The existence of organised trips (lodging, visit, tasting, etc.)	0.0180
10	The existence of specific lodging	0.0126
11	The existence of sports activities in the area	0.0022
12	The appeal of the natural environment in the area	0.0700
13	The existence of organised wine tourism trips	0.0147
14	The area to be visited is famous for its wines	0.0157
15	The fame of the wine in the region	0.0200
16	The existence of well-defined wine routes in the region	0.0174
17	The climate of the area	0.0723
18	The existence of specific gastronomic activities	0.0237
19	The existence of a varied gastronomic offer	0.0248
20	The possibility of participating in cultural tourism in the area	0.0206
21	The existence of stores/open-air markets for agricultural products from the area	0.0228
22	The existence of stores/open-air markets for artisan products from the area	0.0233
23	The possibility of taking wine tasting courses	0.0139
24	Being able to increase my knowledge of wine	0.0272
25	The possibility of participating in wine production activities	0.0265
26	Meeting the winery owners	0.0187
27	The existence of activities for children	0.0062
28	The existence of wine museums or exhibitions	0.0103
29	The existence of leisure/wine therapy activities	0.0056

	Top 5
	Bottom 5

able to buy the wines produced at the winery; (3) having wine specialists take care of you during visits; (4) the appeal of the natural environment in the area; (5) the climate of the area; and (6) the existence of stores/open-air markets for artisan products from the area. These results are similar to those obtained by Bruyer et al. [50] and Kim et al. [69], in which the core wine destination components were tasting wine, winery visits and natural landscape.

However, the findings on heterogeneity extend the knowledge that exists in the development of tourist winery products as all the stakeholders involved in the development of wine tourist products in Sardinia need to be aware that a unique solution that fits all consumers' expectations is unlikely to exist. This important conclusion is achieved by estimating a discrete choice model based on BWS data with rigorous models that account for random and systematic heterogeneity.

It is interesting to see that winery managers could have directly under their control five out of the set of the six attributes mentioned above. The climate is the only attribute which can be considered as a natural endowment of the region and escape from the direct control of the managers. In addition, destination marketers in Sardinia could be at least especially helpful in the attributes 3, 4 and 6. In this respect, Sardinia could develop an educational program that provides enough skills to those in charge of the winery visits. The educational programs to improve the skills of winery visit guides should not only be developed for those already winery workers but also for the future entrants. The idea is to develop a cohesive standard program that allows guides to deliver authentic and unforgettable experiences in the winery. Given the heterogeneity nature of the attribute, it is highly recommended that the visits could be tailored to visitors' preferences. Duarte-Alonso and Kok [70] identify the main traits and features of the future professionals in charge of providing experiences in wineries.

Regarding the sixth attribute, the existence of stores/open-air markets for artisan products from the area, it would be interesting to explore the possibilities of a concerted effort between different stakeholders that include wineries, hotels, local food industry, craft artisans in Sardinia as well as Tourist Sardinian Board. In this regard, some municipalities in Sardinia are organizing wine and food festivals throughout the year, and this trend should be even reinforced by the most important wineries of the island.

On the other hand, winery managers and policy makers do not need to focus in the following five attributes: (1) The existence of specific lodging; (2) The existence of sports activities in the area; (3) The existence of activities for children; (4) The existence of wine museums or exhibitions; and (5) The existence of leisure/wine therapy activities. It is interesting to highlight that the results show that the core wine attributes are the most important to potential visitors instead of other complementary offer the can be developed in the wineries or the destination. This suggests that investments in complementary offer like sport, lodging, children's activities, museums and therapies might not be a wise strategy, and the respective stakeholders, destination policy makers and marketers as well as winery managers should be aware of this.

The above results contrast highly with those mentioned in Back et al. [71] because the authors analyze the winery Marqués de Riscal in La Rioja (Spain) which is well-known in the sector for developing an iconic post-modernist hotel designed by the renowned Canadian architect Frank Gehry as part of a broad wine tourist development named "City of Wine". The Marqués de Riscal project also included a wine-therapy spa, two restaurants and conference and events facilities. In summary, a complementary offer that was not positively valued by the current wine tourist demand in Sardinia.

Furthermore, the interaction of other eight covariates serve to measure how the heterogeneity is affected by other attitude variables towards wine in general and other socio-demographic variables. In this case, eight covariates are found to have an effect. Thus, there are three attitudinal variables regarding wine: (1) I am interested in wine and in the activities related to it; (2) the possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia; and (3) I frequently read magazines that are specialized in wines. In addition, there are five socio-demographic covariates: (1) Gender; (2) Age; (3) Prior experience; (4) Length of stay; and (5) being a Sardinian resident or a domestic/international traveler.

Results suggest that the development of wine tourist products needs to take into account not only the attributes under the winery control but also the visitors' attitude towards wine in general and other important segmentation covariates in order to match potential visitors' preferences. For example, the existence of stores/open-air markets for artisan products from the area which could engage visitors with complementary products providing an incentive to visit wineries [57] is found in Sardinia to be negatively affected by being interested in wine and in the related activities to it, by being male and by having a longer vacation duration; the first result confirms prior studies [72].

6. CONCLUSIONS

The findings are significant for researchers, wine producers and managers. On the one hand, they provide further theoretical and methodological insights into the scientific debate devoted to analyze how different service features need to be bundled to design and to run an effective service/experience winery product that is able to please the visitors' expectations and needs.

From a managerial point of view, our findings provide useful information to destination marketers, policy makers, wine producers and managers attempting to deep their knowledge about the most relevant visitors' expectations and needs so that the information can be used to plan and run marketing and promotion campaigns also recognizing the nuances in the way these expectations/needs changed based on the socio-demographic characteristics of their guests and their travel-related variables. For example, our findings show that visitors travelling in Sardinia as authentic wine lovers identify as critical aspects for the visit the climate of the area and the complementary offer of local artisan stores and open-air markets. Thus, this niche market should not be promoted with other attributes like the possibility of buying wine during the visit, the natural landscape or having wine specialist during the visit. Similarly, winery products based on the appeal of the natural environment in the area is not found to have a positive interaction with any segmentation variable so the attribute should not be included in the promotional brochures. Thus, we extend the results obtained by Bruwer and Lesschaeve [73] in which winescape construct is analyzed integrating three theoretical concepts, namely servicescape, destination choice and place-based marketing theories. In the case of the Niagara Peninsula Wine Region, the authors suggest that managerial efforts should promote the area with equilibrated messages between "the core wine tourism product elements such as wine tasting and/or buying and the hedonic experience elements (p. 625)." The authors conclude that the promotional material needs to be based in sound scientific approach.

Although this study helps to fill a gap in the existing knowledge in the literature and proposes some implications for practitioners, limitations still remain. Firstly, it is based on a convenience sample and is highly site specific (i.e. Sardinia, Italy), thus rendering hardly generalizable. Future studies might replicate the study in other wine tourism destinations to verify the robustness and generalizability of our findings taking into account the concerns expressed by one of the reviewers. In this sense, it is necessary to analyse whether the results of the current approach are robust in comparison with the real best-worst choice experiments. Furthermore, this study considered a limited set of socio-demographics and travel-related variable. Future studies might consider widening the set of these variables and ascertain their moderator effect on visitors' expectations and needs (e.g., travel party). In a similar vein, future studies could also consider the moderating effect exerted by other psychographic variables (e.g. personality, life style, etc.).

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STATISTICAL ANNEX

Table A1. Estimation results. Multinomial Logit models.

Name		Variable description	MNL1			MNL2		
Par	Var		Estimates	t-test	p-val	Estimates	t-test	p-val
α_{ASC1}	ASC1	Alternative 1 specific constant	-0.282	-16.8	0	-0.61	-20.76	0
α_{ASC2}	ASC2	Alternative 2 specific constant	-0.541	-30.38	0	-0.859	-32.41	0
α_{ASC3}	ASC3	Alternative 3 specific constant	-0.454	-25.79	0	-0.629	-28.13	0
λ_W	W	W=1 for worst choices (scale factor)	0	-	-	-0.625	-17.61	0
β_{D1}	D1	To be able to taste the wines produced at wineries	1.9	33.99	0	2.44	32.32	0
β_{D2}	D2	Being able to visit wineries	1.99	35.72	0	2.47	33.85	0
β_{D3}	D3	The visiting hour of the wineries are long/extended	1.3	23.14	0	1.68	22.5	0
β_{D4}	D4	Being able to buy the wines produced at the wineries	2	35.39	0	2.53	33.88	0
β_{D5}	D5	Having wine specialists take care of you during visits	1.76	30.46	0	2.3	30.21	0
β_{D6}	D6	The existence of specific gastronomic activities	1.09	19.98	0	1.43	19.28	0
β_{D7}	D7	The existence of a varied gastronomic offer	0.887	16.35	0	1.25	16.65	0
β_{D8}	D8	The possibility of eating at the wineries	0.656	12.06	0	0.938	12.64	0
β_{D9}	D9	The existence of organised trips (lodging, visit, tasting, etc.)	0.872	16.3	0	1.12	15.46	0
β_{D10}	D10	The existence of specific lodging	0.532	9.77	0	0.729	9.53	0
β_{D11}	D11	The existence of sports activities in the area	-0.954	-16.47	0	-1.64	-15.46	0
β_{D12}	D12	The appeal of the natural environment in the area	1.56	28.17	0	2.02	27.31	0
β_{D13}	D13	The existence of organised wine tourism trips	0.736	13.62	0	1.02	13.49	0
β_{D14}	D14	The area to be visited is famous for its wines	0.941	18.23	0	1.2	17.06	0
β_{D15}	D15	The fame of the wine in the region	0.889	16.17	0	1.21	16.07	0
β_{D16}	D16	The existence of well-defined wine routes in the region	0.774	14.56	0	0.974	13.25	0
β_{D17}	D17	The climate of the area	1.11	20.97	0	1.36	19.62	0
β_{D18}	D18	The existence of specific gastronomic activities	1.15	21.11	0	1.4	19.25	0
β_{D19}	D19	The existence of a varied gastronomic offer	1.14	20.93	0	1.38	19	0
β_{D20}	D20	The possibility of participating in cultural tourism in the area	0.919	17.37	0	1.18	15.99	0
β_{D21}	D21	The existence of stores/open-air markets for agricultural products from the area	1.2	21.59	0	1.53	20.56	0
β_{D22}	D22	The existence of stores/open-air markets for artisan products from the area	0.961	17.57	0	1.32	18.15	0
β_{D23}	D23	The possibility of taking wine tasting courses	0.549	10.08	0	0.912	11.76	0
β_{D24}	D24	Being able to increase my knowledge of wine	1.05	19.21	0	1.45	19.24	0
β_{D25}	D25	The possibility of participating in wine production activities	1.17	21.15	0	1.54	20.63	0
β_{D26}	D26	Meeting the winery owners	0.874	16.17	0	1.28	16.89	0
β_{D27}	D27	The existence of activities for children	0.0634	1.17	0.24	0.0938	1.17	0.24
β_{D28}	D28	The existence of wine museums or exhibitions	0.403	7.39	0	0.615	8.08	0
$l^*(0)$			-39057.763			-39057.763		
$l^*(\beta)$			-35356.212			-35182.887		
ρ^2			0.095			0.099		
Adj. ρ^2			0.094			0.098		
Num. Obs.			31436			31436		

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Table A2. Estimation results. Random parameter Mixed Logit model.

Parameter name	Variable name	Variable description	RPL1 Estimate	t-test	p-val	Confidence Interval Low	Up
Fixed parameters							
α_{ASC1}	ASC1	Alternative 1 specific constant	0.2682	10.84	0.00	0.22	0.32
α_{ASC2}	ASC2	Alternative 2 specific constant	-0.1536	-5.82	0.00	-0.21	-0.10
α_{ASC3}	ASC3	Alternative 3 specific constant	-0.2546	-9.57	0.00	-0.31	-0.20
β_{D1}	D1	To be able to taste the wines produced at wineries	2.8895	34.97	0.00	2.73	3.05
β_{D3}	D3	The visiting hour of the wineries are long/extended	1.8950	24.50	0.00	1.74	2.05
β_{D6}	D6	The existence of specific gastronomic activities	1.6941	23.58	0.00	1.55	1.83
β_{D7}	D7	The existence of a varied gastronomic offer	1.3537	19.47	0.00	1.22	1.49
β_{D8}	D8	The possibility of eating at the wineries	0.9324	13.40	0.00	0.80	1.07
β_{D9}	D9	The existence of organised trips (lodging, visit, tasting, etc.)	1.1706	16.78	0.00	1.03	1.31
β_{D10}	D10	The existence of specific lodging	0.8166	12.03	0.00	0.68	0.95
β_{D11}	D11	The existence of sports activities in the area	-0.9244	-13.18	0.00	-1.06	-0.79
β_{D13}	D13	The existence of organised wine tourism trips	0.9655	14.13	0.00	0.83	1.10
β_{D14}	D14	The area to be visited is famous for its wines	1.0334	15.13	0.00	0.90	1.17
β_{D15}	D15	The fame of the wine in the region	1.2778	17.68	0.00	1.14	1.42
β_{D16}	D16	The existence of well-defined wine routes in the region	1.1350	16.57	0.00	1.00	1.27
β_{D18}	D18	The existence of specific gastronomic activities	1.4453	20.15	0.00	1.30	1.59
β_{D19}	D19	The existence of a varied gastronomic offer	1.4935	20.91	0.00	1.35	1.63
β_{D20}	D20	The possibility of participating in cultural tourism in the area	1.3054	19.04	0.00	1.17	1.44
β_{D21}	D21	The existence of stores/open-air markets for agricultural products from the area	1.4061	18.57	0.00	1.26	1.55
β_{D23}	D23	The possibility of taking wine tasting courses	0.9129	13.25	0.00	0.78	1.05
β_{D24}	D24	Being able to increase my knowledge of wine	1.5851	22.00	0.00	1.44	1.73
β_{D25}	D25	The possibility of participating in wine production activities	1.5594	21.53	0.00	1.42	1.70
β_{D26}	D26	Meeting the winery owners	1.2105	17.05	0.00	1.07	1.35
β_{D27}	D27	The existence of activities for children	0.1024	1.52	0.13	-0.03	0.23
β_{D28}	D28	The existence of wine museums or exhibitions	0.6111	8.79	0.00	0.47	0.75
Random parameters (estimated mean)							
μ_{D2}	D2	Being able to visit wineries	4.1943	11.12	0.00	3.45	4.93
μ_{D4}	D4	Being able to buy the wines produced at the wineries	4.1684	16.04	0.00	3.66	4.68
μ_{D5}	D5	Having wine specialists take care of you during visits	3.6615	9.95	0.00	2.94	4.38
μ_{D12}	D12	The appeal of the natural environment in the area	3.1261	14.37	0.00	2.70	3.55
μ_{D17}	D17	The climate of the area	2.3399	5.08	0.00	1.44	3.24
μ_{D22}	D22	The existence of stores/open-air markets for artisan products from the area	2.3287	6.42	0.00	1.62	3.04
Random parameters (estimated standard deviation)							
σ_{D2}	D2	Being able to visit wineries	2.5911	15.04	0.00	2.25	2.93
σ_{D4}	D4	Being able to buy the wines produced at the wineries	2.1704	17.58	0.00	1.93	2.41
σ_{D5}	D5	Having wine specialists take care of you during visits	1.9262	14.56	0.00	1.67	2.19
σ_{D12}	D12	The appeal of the natural environment in the area	2.0137	15.50	0.00	1.76	2.27
σ_{D17}	D17	The climate of the area	1.7108	15.40	0.00	1.49	1.93
σ_{D22}	D22	The existence of stores/open-air markets for artisan products from the area	1.4104	14.22	0.00	1.22	1.60

Parameter name	Variable name	Variable description	RPL1				
			Estimate	t-test	p-val	Confidence Interval	
						Low	Up
Systematic heterogeneity in mean							
μ_{D2*V2}	D2*V2	Being able to visit wineries * The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	-0.2892	-3.56	0.00	-0.45	-0.13
μ_{D2*V4}	D2*V4	Being able to visit wineries * Gender	1.0052	4.08	0.00	0.52	1.49
μ_{D2*V5}	D2*V5	Being able to visit wineries * Age	-0.2183	-2.88	0.00	-0.37	-0.07
μ_{D4*V2}	D4*V2	Being able to buy the wines produced at the wineries * The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	-0.3137	-3.55	0.00	-0.49	-0.14
μ_{D4*V8}	D4*V8	Being able to buy the wines produced at the wineries * Place of residency	0.4779	1.81	0.07	-0.04	1.00
μ_{D5*V2}	D5*V2	Having wine specialists take care of you during visits * The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	-0.2129	-2.38	0.02	-0.39	-0.04
μ_{D5*V7}	D5*V7	Having wine specialists take care of you during visits * Length of stay	-0.1167	-1.08	0.28	-0.33	0.10
μ_{D5*V8}	D5*V8	Having wine specialists take care of you during visits * Place of residency	-0.7163	-2.53	0.01	-1.27	-0.16
μ_{D12*V2}	D12*V2	The appeal of the natural environment in the area *The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	-0.2664	-3.83	0.00	-0.40	-0.13
μ_{D17*V1}	D17*V1	The climate of the area * I am interested in wine and in the activities related to it	-0.4665	-3.98	0.00	-0.70	-0.24
μ_{D17*V2}	D17*V2	The climate of the area * The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	0.3473	3.98	0.00	0.18	0.52
μ_{D17*V3}	D17*V3	The climate of the area * I frequently read magazines that are specialized in wines	-0.2006	-2.03	0.04	-0.39	-0.01
μ_{D17*V4}	D17*V4	The climate of the area * Gender	0.7373	3.38	0.00	0.31	1.16
μ_{D17*V5}	D17*V5	The climate of the area * Age	0.1619	2.46	0.01	0.03	0.29
μ_{D22*V1}	D22*V1	The existence of stores/open-air markets for artisan products from the area * I am interested in wine and in the activities related to it	-0.2050	-2.47	0.01	-0.37	-0.04
μ_{D22*V2}	D22*V2	The existence of stores/open-air markets for artisan products from the area * The possibility to visit wineries and to experience activities related to wine were sufficient elements for taking a trip to Sardinia	0.1494	2.23	0.03	0.02	0.28
μ_{D22*V4}	D22*V4	The existence of stores/open-air markets for artisan products from the area * Gender	-0.5425	-2.94	0.00	-0.90	-0.18
μ_{D22*V7}	D22*V7	The existence of stores/open-air markets for artisan products from the area * Length of stay	-0.1490	-2.03	0.04	-0.29	-0.01
$l*(0)$			-39057.763				
$l*(\beta)$			-32295.715				
ρ^2			0.173				
Adj. ρ^2			0.172				
Num. Obs.			31436				