Enotourist satisfaction: A multidimensional approach

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Abstract

This study aims to analyze the dimensions that determine an enotourist's experience when (s)he visits wineries. In addition, in a novel approach, this work examines the influence of wine routes on this experience. On the basis of a set of reviews posted by wine tourists on TripAdvisor, Latent Dirichlet Allocation analysis is conducted to identify the dimensions that determine the wine tourism experience. Subsequently, ordinal logistic regression analysis is performed to identify the most determinant dimensions of visitors' assessments of their experiences and the influence of wine routes. Results indicate that the "staff" dimension, associated with the treatment provided by tour guides, is the most determinant dimension. In addition, significant differences are observed in the assessment of attributes across the different wine routes.

Keywords: enotourism, experience, LDA, ordinal logistic regression

Introduction

Wineries must offer their visitors a satisfactory wine tourism experience because visitor satisfaction plays a crucial role in shaping future demand (Alaei et al., 2019). In the tourism industry, much of the consumer decision-making process is based on emotions and positive feedback from previous visitors (Wu et al., 2022). This idea is in line with experience goods theory, which posits that the quality of certain goods or services—such as tourism experiences—can only be assessed after consumption (Bosangit et al., 2015). In the context of wine tourism, the satisfaction felt during and after the visit becomes a key driver for future consumer behavior, making it essential for wineries to meet visitor expectations.

Visitor satisfaction also relates to consumer utility theory, which suggests that individuals make decisions to maximize their utility—or satisfaction—from the consumption of goods and services (Nicolau and Sharma, 2022). For wineries, understanding what aspects of the wine tourism experience contribute most to consumer utility is crucial (Shin and Nicolau, 2022). Positive emotions and a sense of value gained from the experience influence not only the immediate satisfaction of the visitor but also their likelihood of sharing their experience online and/or recommending the winery to others (Meneses et al., 2023). The significance of satisfaction has led to a large body of academic literature focused on developing tools to measure and enhance it (Berry & Parasuraman, 2004; McColl-Kennedy & Schneider, 2000).

Satisfaction has traditionally been measured using survey-based data, which can be costly to undertake and can be subject to biases. Based on user-generated content posted on online platforms, new technologies now provide alternative approaches to measuring tourist satisfaction (Wang, 2017; Alaei et al., 2019; Sheth, 2021; Chen et al., 2022). This shift is in agreement with reputation theory (Zinko et al., 2007), which emphasizes the importance of reputation as an intangible asset in shaping consumer behavior. Online reviews and electronic word-of-mouth are powerful tools in the wine tourism industry because they contribute to building a winery's reputation. A positive reputation, fostered through favorable reviews, enhances consumer trust and drives future visits (Yadav et al., 2024), while negative feedback can harm the individual winery and the collective reputation of the wine route (Qi et al., 2024).

In this study, we analyze the satisfaction of enotourists who visited wineries, using online reviews as a measure of satisfaction. By applying latent Dirichlet allocation (LDA) (Blei et al., 2003), an unsupervised machine learning technique, we identify the key dimensions of the wine tourism experience that influence satisfaction. This multidimensional approach to experience, as highlighted by experience goods theory, is critical to understanding how different elements of the winery visit contribute to overall satisfaction.

Additionally, we assess the impact of the winery being part of a wine route, which functions as a destination management organization (DMO). Ben-Tahar et al. (2021) highlighted the central role that DMOs play in coordinating collective and coherent wine tourism strategies and in creating destination brands that bring together the wine tourism offers (e.g., wineries, accommodation, restaurants) in a given region. From a reputation theory perspective, wine routes create a collective brand that influences tourist expectations. The collective reputation of the wine route can positively or negatively affect visitor satisfaction at individual wineries. By ensuring a consistent and high-quality experience across member wineries, wine routes can enhance their reputation, driving tourism demand and creating a spillover effect on individual wineries.

In summary, this study aims to identify the dimensions of an enotourist's experience and analyze how a winery's affiliation with a wine route influences visitor satisfaction. From the

perspective of experience goods theory, consumer utility theory, and reputation theory, we provide insights into how wineries can enhance their wine tourism offerings and reputation to attract and retain satisfied visitors.

Literature review

Dimensions of the wine tourist's experience

The experiential dimension is a crucial factor for academics and practitioners in the tourism field (Bosangit, Hibbert, and McCabe, 2015). According to experience goods theory, which suggests that the quality of certain goods or services can only be fully evaluated after consumption (Bosangit et al., 2015), understanding how enotourists' experiences shape their perceptions of satisfaction and influence future decisions is critical. Given that wine tourism involves experiential goods, its value is often determined through direct interaction with the product and the environment. This is in line with the consensus in the literature that consumer experiences should be conceptualized multidimensionally, what is especially important in wine consumption (Oyinseye et al., 2022). Enotourism is an experience in which the senses play a central role (Getz, 2000) and which provides tourists with enjoyment. Many authors have highlighted the importance of the tourist's experience in the specific field of enotourism (Carmichael, 2005; Bruwer and Alant, 2009; Cohen and Ben-Nun, 2009; Hojman and Jones, 2012; Pikkemaat, Peters, Philip, and Secco, 2009; Quadri-Felitti and Fiore, 2013; Thanh and Kirova, 2018, Brochado et al. 2021a). Enotourists are looking for an experience where they can taste, buy and learn about wine, and enjoy gastronomic, cultural, entertaining and social experiences (Bruwer and Alant, 2009; Quadri-Felitti and Fiore, 2016). From the perspective of consumer utility theory, which suggests that individuals make decisions to maximize satisfaction, these diverse dimensions of the enotourism experience contribute to the overall utility that visitors derive from their winery visits.

From a conceptual point of view, these experiences are determined by the activities that tourists undertake during their visits to wineries. The dimensions are important; proper management of the dimensions can affect the tourist's final satisfaction with his/her visit (Carlsen and Boksberger, 2015), and tourist satisfaction is an essential variable in tourism marketing with a great influence on intentions to repurchase and recommend. In the specific case of enotourism, Sellers and Nicolau (2021) showed that an enotourist's satisfaction had a positive effect on the amount of money (s)he spent at wineries.

Given its importance, several authors have tried to identify the dimensions of the wine tourism experience using different methodologies.

Pine and Gilmore's (1999) experience economy model identifies four experience dimensions (entertainment, education, esthetics, and escapism – the "4 Es"); it has been shown to be an appropriate framework in the tourism context (Gilmore and Pine, 2002). The model has been successfully applied in the enotourism field (Thanh and Kirova, 2018; Angelini and Gilli, 2021). Analyzing 825 reviews posted on TripAdvisor by enotourists visiting Cognac (France), Thanh and Kirova (2018) used QSR NVivo software to identify the dimensions of the tourist experience on the basis of the 4Es. Similarly, Angelini and Gilli (2021) used in-depth interviews with winery managers and 95 comments posted by enotourists on Google and Facebook to identify and classify the wineries' enotourism offerings.

Other authors have tried to identify the latent dimensions of enotourists' experiences (not drawing on Pine and Gilmore's model [1999]). For example, studies have conducted lexical analyses of TripAdvisor reviews of visits to wineries. These dimensions can be defined a priori by the researcher or identified in exploratory analyses. Kastenholz et al. (2020), in a focus on the PDO Bairrada (Portugal), analyzed a sample of 137 enotourism reviews posted on TripAdvisor in 2019 and 2020. Their results highlighted the roles of wine, tangible cultural heritage, and natural landscapes in providing satisfying emotional experiences, and the roles of professional services and quality facilities. However, this methodology has a crucial limitation where the researcher may be subjective when defining the dimensions, which can affect the reliability of the results (Wilk et al., 2019). Consequently, some authors have tried to identify the dimensions by applying exploratory analyses based on the co-occurrence of terms used in reviews.

Using Leximancer software, Brochado et al. (2020, 2021a, 2021b) performed cluster analysis based on the co-occurrence of terms identified in a conceptual graphic map. In the 2020 study, Brochado et al. (2020) analyzed 4,114 reviews of 52 wine-focused hotels in 11 countries. The dimensions, identified through a lexicographic analysis, were as follows: wine, lodging, food, scenery, staff, and recommendations. Brochado et al. (2021a) analyzed 470 TripAdvisor reviews of wineries in the Douro region and identified 12 dimensions: wine, views, staff, room, hotel, food, restaurant, pool, service, Douro, deliciousness (food and wine), and comfort. Looking specifically at wine tours, Brochado et al. (2021b) analyzed 878 TripAdvisor reviews of 20 Portuguese tours. The authors developed a concept map containing the following themes: tour, guide, experience, excursion, service, food, recommendation, fun, return, walk, difference, and wildlife.

Barbierato et al. (2021) analyzed 9,616 reviews of 600 tours of Tuscany (Italy) posted between 2010 and 2020. The results identified six dimensions of the tourist experience: tour guide; logistical aspects; wine quality; food quality; complementary tourist and recreational activities; landscapes and historic villages. The key element of satisfaction was the effective integration of the wine product, food, landscape and historic villages dimensions, while problems with the organizational and planning dimensions could cause dissatisfaction. The tour guide also played a fundamental role in satisfaction.

Drawing on a sample of 9,376 TripAdvisor (English language) reviews of 524 Spanish wineries, Shin and Nicolau (2022) identified six tourist experience dimensions: "wine-related," "overall experience," "additional attractions," "food," "cost," and "staff service." The three determinant dimensions of a satisfactory experience were "wine-related," "overall experience," and "staff service." "Cost" was the dimension most associated with poor experiences.

Gao et al. (2022) synthesized existing literature into four dimensions for creating value in wine tourism: product-related aspects, sensory and affective experiential aspects, cognitive and educational experiential aspects, and social–relational experiential value creation aspects. Utilizing 3,449 English online reviews from wine tourists in Australia, these authors developed a deep neural network-based framework using AI-driven exploratory design, showing that beyond product-related aspects, sensory and educational experiential aspects also play a crucial role in value creation in wine tourism.

Eventually, Wu et al. (2024) identified 11 attributes for domestic wine tourists and seven attributes for outbound wine tourists. With a sample of 5,658 reviews from domestic tourists and 1,366 reviews from outbound tourists on the Chinese platform Ctrip from 2015 to 2023,

their results evidence three common attributes for domestic and outbound tourists: "scenic view," "wine tasting and purchase," and "wine knowledge."

In a novel approach, the present study analyzes the impact of wine routes on the experience and satisfaction of enotourists.

Importance of wine routes in enotourism

Wineries play a fundamental role as the key facilitators of enotourism by granting access and organizing visits to their facilities. Nonetheless, the overall appeal of the destination, including its accommodation options, climate, gastronomy, natural surroundings and cultural activities, also significantly shapes the tourist experience. This perspective is supported by Marzo-Navarro and Pedraja-Iglesias (2012) and is corroborated by previous research that highlighted the crucial role of destination image in the formation of tourists' perceptions. Leri and Theodoridis (2021) conceptualized an enotourist's experience as multidimensional, bringing together the wide variety of activities undertaken at wineries and the broader environmental context, which they termed the "wine landscape," in an intricate intertwining of the destination and its territorial essence. This multidimensional nature of enotourism, involving a blend of sensory and social experiences, aligns with experience goods theory, where the value of the experience is often assessed post consumption. Consequently, scholars advocate the development of strong destination brands to enhance their attractiveness to potential tourists (Gómez et al., 2015).

The role of the destination in wine tourism is often manifested through the so-called Wine Routes (Hojman and Hunter-Jones, 2012); these were characterized by Gatti and Incerti (1997) as "sign-posted itinerar[ies], through a limited area (region, province, denomination area) whose aim is the discovery of the wine(s) product(s) in the region and the activities which are associated with it." In this context, reputation theory is critical to understanding how wine routes—structured as destination brands—shape the perceptions of enotourists. Wine routes function as collective brands that create reputational spillovers benefiting member wineries. A positive collective reputation, built on consistent quality across the wine route, can enhance tourists' expectations and satisfaction. This symbiotic relationship between tourism and the wine sector is represented by designations of origin, that is, geographical indications of wine-producing regions; these have significant brand value (Hall et al., 2000). These collective brands, which include the wine route and the designation of origin, differentiate and identify wine tourism destinations, foster winery–consumer connections, and provide competitive advantage (Gómez et al., 2015). The brand image associated with designations of origin plays a crucial role in attracting visitors to wineries (Caldwell and Freire, 2004).

The strategic positioning of enotourism regions is critical to the success of destinations, with various regions having implemented tailored strategies to attract wine tourists (Getz and Brown, 2006). Bruwer (2003) emphasized the importance of the brand that distinguishes a region, while Hall et al. (2000) underlined the importance of the region's attributes, encapsulated within the concept of "winescape" (e.g., Thomas, Quintal, and Phau, 2018), extended to the notion of the tourist "terroir" by Hall and Mitchell (2002). This amalgam of physical, cultural, and natural elements defines each region's unique appeal to enotourists (Sparks, 2007). In addition, as the origin of a wine significantly influences consumer decision-making and the combination of environmental and territorial factors confers distinctive sensory characteristics to a wine, which are often associated with specific locations (Famularo et al., 2010), enotourists' expectations will be highly likely based on the producing region (Charters and Ali-Knight, 2002). This

suggests that the attributes of destinations cannot be ignored when analyzing the factors that affect the selection of wine tourism activities (Getz, 1999; Getz and Brown, 2006) or the impact that these activities may have on the enotourist's experience.

Methodology and sample

An analysis of reviews posted on TripAdvisor by enotourists about their activities in Spanish wineries was undertaken to achieve the objectives of the work.

First, information about wineries was downloaded from TripAdvisor. The period analyzed was 2010–2021. A total of 35,648 individual enotourist reviews (Spanish language) were downloaded about the 797 wineries that made up the final sample. A total of 341 wineries belong to a wine route. Of the 456 that do not belong to a route, 426 are located in territories where there were official wine routes. The most represented wine routes are "Rioja," through its three different appellations ("Alta," "Alavesa," and "Oriental") and "Ribera del Duero."

Second, an LDA was used to identify the dimensions (aspects) of the wine tourists' reviews. LDA is an unsupervised machine learning technique, which has been defined as a dimension reduction method that identifies latent themes (topics) in a set of text documents, using a probability distribution in a vocabulary of words (Blei et al, 2003). This methodology has been used in different economic and business areas. For example, Gurrib and Kamalov (2002) employed LDA to predict bitcoin price movements, while García-Méndez et al. (2023) used LDA to identify relevant text within financial news. In the field of marketing, Tirunillai and Tellis (2014) explored the dimensions related to the perception of quality, how they change over time, and how they relate to the competitive positioning of brands. Li and Ma (2020) showed how topic analysis can be applied to the search terms used by consumers to identify the stage they are at in their decision-making processes. The approach has been used to find spoilers in movie reviews which, far from harming ticket sales, help sales (Ryoo et al., 2021). In tourism, the approach has also been used in different contexts. Guo et al. (2017) used LDA to extract the dimensions of visitor satisfaction from online hotel reviews. Annisa and Surjandari (2019) analyzed hotel customer reviews. Taecharungroj and Mathayomchan (2020) analyzed reviews of tourist attractions in Thailand. Ali et al. (2022) used topic analysis to explore the opinions of tourists visiting attractions and staying in hotels in Marrakech. Wang et al. (2021) used a method to analyze the image of a nature reserve/park in China. Mirzaalian and Halpenny (2021) analyze the opinions of tourists visiting Jasper National Park (Canada). Li et al. (2020) used the methodology, examining companies' financial reports, to identify the main risks faced by the tourism industry. Mariani and Baggio (2022) used the methodology to identify the main themes in tourism-based studies examining the application of big data.

An essential aspect of LDA analysis is the preprocessing of the documents on which the analysis will be performed. Reviews of less than 100 characters and/or 10 words were removed due to their limited semantic content (Gao et al., 2018). An exploratory analysis of the reviews detected that posters tended to insert the name of the winery tour guide (e.g. "Antonio gave us excellent service") and, thus, the 200 most common names in Spain were replaced by the generic term "staff." To prepare the reviews for LDA analysis, the following procedure was followed: (i) transformation of each review to lowercase letters; (ii) removal of special characters (%, $, &, etc.), punctuation marks (?, !, etc.) and numbers; (iii) removal of stop words, the most frequent adjectives, and two words that appeared frequently in all reviews (visit and winery); (iv) normalization of the text (root identification, stemming, and lemmatization). For root identification, the SnowballC library was used (in R) to eliminate plurals, while for

lemmatization, a specific dictionary was used to reduce the forms of inflectional and derived words to a common base form, which improves the performance of the algorithm; (v) text tokenization. Each document was separated into tokens with unique meanings. Specifically, individual words and bigrams (combinations of two words that tend to appear together, e.g., barrel rooms), and words that have a specific meaning, were used as tokens.

Following the processing of the reviews, 35,240 documents remained. The reviews were then formed into sentences (Li et al., 2020; Li et al., 2024), and a "document term matrix" was created; this matrix identifies, for each document, the number of times each of the tokens (words and bigrams) appears.

Thereafter, the model was trained. A drawback of LDA is the need to indicate, a priori, the number of topics or dimensions that should be found in the documents, but no single, universal method exists to do so (Miner et al., 2023). In the literature, two main approaches are used (Calli and Calli, 2023): qualitative and quantitative. Various metrics such as perplexity or coherence are used in quantitative approaches. However, some authors (Berger et al., 2022; Aletras and Stevenson, 2013) have argued that metrics that seek to minimize perplexity or maximize coherence do not guarantee the generation of dimensions that are interpretable by researchers or that make semantic sense so that the interpretation of the theme or meaning of each topic ultimately depends on the researcher, which leaves him/her a high degree of freedom, which may not be desirable. In other words, models that look good quantitatively, may not be subjectively ideal (Miner et al., 2023). For this reason, a qualitative, exploratory evaluation must be performed to determine the number of topics identified. Thus, in the present study, a mixed approach was taken to determine the number of topics in the research. To this end, the results obtained by estimating the model with different numbers of topics (from K = 2 to 15) were evaluated, and it was decided that six was the optimal number to facilitate interpretation, given that from seven, a high overlap between topics was observed. The *textmineR* library in R was used for the LDA analysis.

Subsequently, a sentiment analysis of the reviews was conducted using the Afinn lexicon, which has been used in the enotourism field by Barbierato et al. (2021). Penagos-Londoño et al. (2022) used this lexicon to evaluate wine reviews by experts. In this work, the sentiment value of the wine tourist's review is the sum of the polarity of each of the words used in the review. In addition, the effect of amplifiers was considered (e.g., "the cellar is very pretty" is given greater sentiment value than "the cellar is pretty"), as was text that could alter the context of the word under analysis (e.g., "the cellar is not pretty at all" has a negative sentiment), that is, the four words before and after the word were considered. Sentiment analysis was performed by assigning each sentence of the reviews to one of the previously identified dimensions, based on how many words in the sentence belonged to the assigned dimension through the "gamma" metric of the LDA. The gamma metric shows how much each sentence is associated with each topic. Specifically, this metric is the per-sentence-per-topic probability or the proportion of the sentence that is made up of words from the assigned topic. In this manner, a sentiment rating was obtained for each dimension included in the reviews. To assess the stability and reliability of the sentiment analysis, we compared the extracted sentiment using the Afinn lexicon with the extracted sentiment using the NRC lexicon and the extracted sentiment using a large language model (ChatGPT), which exhibited the highest performance in the analysis conducted by Wu et al. (2024). First, each review was analyzed with the Spanish version of the NRC lexicon and classified as positive or negative. In general, both lexicons (Afinn and NRC) yield similar valuations because they classify 88.7% of the reviews in the same category.

Following the recommendation of Wu et al. (2024), we also used a large language model (ChatGPT) to assess the sentiment of 112 randomly selected reviews (55 with a positive sentiment and 57 with a negative sentiment). Each review was analyzed by ChatGPT with the following prompt (in Spanish):

"I want you to act as an expert in sentiment analysis who specializes in the tourism industry. Next, I'm going to give you a set of reviews that visitors to a winery have written after taking a visit to a winery. For each of the reviews, you must indicate whether the overall sentiment of the visitor is positive or negative. If it is positive, you will indicate a 1, if it is negative, you will indicate a −1."

Overall, Afinn and ChatGPT offered similar sentiment valuations, given that 87.5% (98/112) of the reviews are rated in the same sense (positive or negative).

An ordinal logistic regression analysis was performed to analyze the effects of the dimensions on the enotourists' assessments of their visits (at the tourist level). This model assumes the existence of a qualitative variable Y, of an ordinal nature (in this case, the rating of the tourist review), that contains y_1, y_2, ...y_c categories (in this case, c = 5). Y is assumed to be a function of a series of independent variables X_1, X_2,….X_m, such that the variables are related as follows:

$$f\left(\gamma_j(X)\right) = \log\left[\frac{\gamma_j(X)}{1-\gamma_j(X)}\right] = \log\left[\frac{P(Y\leq y_j:X)}{P(Y>y_j:X)}\right] = \alpha_j + \beta X, \quad j = 1,...,c-1\ ,$$

where $\gamma_j(x) = P\left(Y \leq y_j:X\right) = \frac{e^{\alpha_j+\beta X}}{1+e^{\alpha_j+\beta X}}$ is the logit link function. For each category of variable Y, an equation was estimated; thus, c−1 equations were estimated. The parameters of the estimated model are α_j and $\beta = (\beta_1,\beta_2,...,\beta_m)$. For each equation, an intercept value of α_j was estimated, and the coefficients of the explanatory variables were assumed to be constant in the c−1 equations (parallel lines assumption). The coefficients denote the importance of each independent variable in explaining the categories of the dependent variable. The rating of the review was considered a dependent variable, and the sentiment rating of the dimensions included in the reviews were considered independent variables. In addition, a dummy variable was used as an independent variable to reflect whether the winery belonged to a wine route (1 = belonged to an WR; 0 = did not belong to a WR) to analyze the influence of wine routes on the enotourism experience. For this purpose, the details of the wineries belonging to the 32 official Spanish wine routes in 2021 were obtained from the route websites. Of the 797 wineries included in the sample, 341 belonged to a route. Of the 456 that did not belong to a route, 426 were located in territories where there were official wine routes. Two control variables were considered. The first is the percentage of positive reviews (ratings 4 and 5). This control variable is estimated for each year and for each winery and has been considered to control the effect that winery's reviews have on the individual rating made by each tourist. To some extent, it reflects the tourist's expectations about the wine tourism activities offered by the winery. The length of the reviews is also used as a control variable (Shin et al., 2021).

Finally, to analyze the effects of the dimensions on the enotourists' assessments of their visits (at the winery level), we have estimated a mixed effects ordinal logit model. Specifically, with these models, we can deal with the unobserved heterogeneity that occurs because of the existence of unmeasured covariates. With the inclusion of a random intercept at the region (autonomous community) where the winery is located level, we can control for the effect of certain idiosyncratic or cultural traits of a regional nature (related to the geographical area where

the winery is located) on the review ratings made by tourists when visiting a winery. These factors may explain the existence of differences in the average ratings received by wineries belonging to different autonomous communities, thus avoiding a bias in our results. Based on an ordinal qualitative variable Y (calculated from the average rating of the review of each of the wineries), which has y_1, y_2, ... y_c categories (in this case, c = 5 as in the previous regression), Y is a function of a series of independent variables Z_1, $Z_{2...,}$ Z_m with $\theta_1,\theta_2,...,\theta_m$ parameters, a constant term ψ_k, and a random intercept at the autonomous community level that we identify with the letter u:

$$f(\gamma_k(Z)) = \log\left[\frac{\gamma_k(Z,u)}{1-\gamma_k(Z,u)}\right] = \log\left[\frac{P(Y \leq y_k{:}Z,u)}{P(Y > y_k{:}Z,u)}\right] = \psi_k + \theta Z + u, \qquad k = 1,...,c-1$$

where $\gamma_k(Z,u) = P(Y \leq y_k{:}X,u) = \frac{e^{\omega_k+\theta Z+u}}{1+e^{\omega_k+\theta Z+u}}$ is the logit link function. As in the previous regression, the average (for each winery) of the rating of the sentiment of each of the dimensions included in the reviews and the variable identifying the winery's membership (or not) in the wine route are used as independent variables. The control variables are the size of the winery (measured as the logarithm of the volume of assets in thousands of euros), the age of the winery (which is calculated from the difference between the year in which the reviews were made and the year of establishment of the winery), and a dummy variable that identifies whether or not the winery is a commercial company (which takes the value 1 if the winery is a corporation or a limited liability company, and 0 if it has another legal form).

Results

Dimensions of the tourist experience (LDA)

As discussed above, the choice of the number of dimensions or topics to use (k) is one of the most important decisions in LDA analysis. A mixed approach was used to determine this optimal number of topics. This approach helped identify a set of potential topics that are optimal in terms of statistical fit and interpretability. First, from a quantitative perspective, we evaluated the model using topic probabilistic coherence, which measures how associated words are in a topic, controlling for statistical independence. Usually, researchers choose the number of topics (k) that yields the highest topic coherence score. Following this approach, the optimal number of topics would be k = 8 (coherence = 0.193). However, given that the study also seeks to capture dimensions that are managerially relevant to enotourism, we complemented this quantitative analysis with qualitative validation. At this point, two enotourism experts—the manager of the Alicante Wine Route and the head of wine tourism at the "Pepe Mendoza Casa Agrícola" winery—collaborated in the interpretation of the identified dimensions. Their expert insights helped refine the selection of the final number of topics, ensuring that the dimensions not only met statistical criteria but also reflected meaningful aspects of the tourist experience on winery visits. This mixed approach was chosen to balance statistical rigor with practical relevance, optimizing the model for coherence and real-world applicability. With the 8-topic solution, some overlap among topics was observed. Specifically, two topics reflected very similar tangible aspects of the winery and its surroundings, while another two topics were associated with the winery personnel conducting the visits. In accordance with this approach, the number of dimensions was set at k = 6, which yields an average topic coherence of 0.114.

The six dimensions identified are summarized in Table 1[1]. The keywords in each dimension are those words most frequently used and thus are most likely to appear in each dimension (highest beta value within the dimension). They are presented in the order of most important to least important, by topic. Some keywords belong to more than one dimension (e.g., wine, tasting, staff), which is a common feature of LDA analyses. The predominant topic (number of terms used) was "staff," followed by "group experience" and "tasting and sampling." Below is a brief review of each of the dimensions.

The "tangibles" dimension refers to the tangible attributes of the winery, such as the vineyard, the environment, the area, the facilities, and the architecture of the buildings. In service marketing, the tangible attributes that underlie the provision of services are key elements of quality.

The "value for money" dimension refers to the link between what the enotourist received during his/her visit and the price paid for the visit. Among the most frequent terms used in this dimension were wine, quality, price, bottle, taste, shop, and buy. Studies have confirmed the influence of perceived value for money on satisfaction in various contexts (Cronin et al., 2000; Kuo et al., 2009).

The "group experience" dimension refers to an assessment of the visit in relation to the enotourist's companions (group, friends, family, couples) and seems to reflect an overall assessment of the visit/experience. The experiential dimension is basic in the field of service marketing, its importance having been well documented in previous works (Thanh and Kirova, 2018; Angelini and Gilli, 2021).

The "process–production" dimension refers to the winemaking: process, production, history, explanation, vineyard, etc. One of the attractions of enotourism is learning about wine culture; thus, this dimension reflects the interest of the wine tourist in understanding this aspect.

The "tasting–sampling" attribute refers to what has been tasted during the visit, that is, the wines drank and the accompaniments (tasting, sampling, white wine, red wine, cheese, etc.). Without a doubt, this is one of the basic motivations for enotourists who visit wineries.

The "staff" dimension is linked to the winery personnel who conduct the winery visits; it refers to their professionalism, the attention they pay and the service they provide. This dimension is fundamental in the field of tourist services; it includes words such as explanation, treatment, attention, professionalism, and passion. This topic (most frequently used words) is the most prevalent in the reviews analyzed.

<Take in Table 1>

In accordance with the LDA analysis, each sentence in the review was assigned to one of the six dimensions identified on the basis of the proportion of words in the sentence related to that dimension. Each sentence was assigned a sentiment rating, such that, for each review, all the dimensions mentioned have a sentiment rating. Table 2 sets out the descriptive statistics of the sentiment rating for each dimension based on the reviews. The "staff" dimension has the highest rating (3.002; SD = 3.14), followed by the "tasting–sampling" (2.063; SD = 2,947) and

[1] We also run two different LDA analyses splitting our sample of reviews into two groups: (i) reviews for wineries that belong to a wine route and (ii) reviews for wineries that do not belong to a wine route. Broadly speaking, the dimensions identified are similar for both types of reviews.

"tangibles" (1.965; SD = 2.86) dimensions. The dimension with the lowest rating is "group experience" (1.170; SD = 3.008). Thus, the "staff" dimension (the most prevalent) attracted the most references; it was mentioned in more than half (50.18%) of the reviews.

<Take in Table 2>

Table 3 shows the average sentiment rating of each dimension, categorizing the reviews based on whether the winery belonged to a wine route. In general, the ratings for both categories are similar, with differences being significant only in the case of the dimension "tasting–sampling" ($t = 1.972$; $p = 0.049$). In addition, the difference in the "staff" dimension ($t = -1.705$; $p = 0.088$) is only significant at a 10% level. This result is striking given the great efforts made by wine routes to improve the quality of their wine tourism offers. One of the functions of the routes, along with promotion and marketing, is to advocate the quality and product criteria established by the Asociación Española de Ciudades del Vino and the Secretary of State for Tourism in the Tourist Product Manual of the Wine Routes of Spain. However, belonging to a wine route did not seem to improve the tourists' perceptions of satisfaction with their visits to wineries.

<Take in Table 3>

To delve deeper into the effect of wine routes on the wine tourism experience, an additional analysis considered the specific wine route to which the winery belonged. To this end, the average sentiment rating of the different dimensions was calculated on the basis of the particular route to which the winery belonged. In this case, significant differences were observed in the assessment of the dimensions (except for the "tangibles" dimension); thus, important differences were observed in the satisfaction perceived by wine tourists with wineries based on the route to which they belonged.

Ordinal regression results

The results of the first ordinal logistic regression model (tourist review level) are presented below. They allow an evaluation to be undertaken of the effects of the dimensions identified on the probability of rating the visit highly. First, we examine the goodness of fit of the model. We used a likelihood ratio test to verify the preference of the estimated regression with respect to the null model (the model that does not use regressors to explain the dependent variable). This test shows the improvement in fit produced at a 99% confidence level as a result of the independent variables added to the regression ($\chi^2_9 = 10{,}221.080$, $p < 0.001$). The pseudo-R-squares of Nagelkerke (0.305) and Cox and Snell (0.257)[2] reveal that the model has adequate predictive power. The results of the deviance test also suggested that the model fit (52.493; $p = 1$) has no problems. Finally, the confounding matrix (which shows the performance of the ordinal logistic regression) reveals that the model correctly predicted 72.3% of cases. The VIF values indicated no multicollinearity problems.

The results of the prediction values and the odds ratios are presented in Table 4. Specifically, the dimension that had the greatest effect on the enotourists' assessments of their visits is the "staff" dimension. Keeping all other variables constant, for each additional assessment point in the staff dimension is a 1.171 times greater probability of the visit being awarded a higher rating. The second most determinant dimension in the overall assessments is "group experience." For each additional point obtained in this dimension, the probability of enhancing

[2] Hensher and Johnson (2018) considered logistic models to have reasonably good fit when the pseudo-R^2 is between 0.2 and 0.4.

the rating of the visit increases 1.116 times. The dimension with the least effect on the dependent variable is "tangibles" (the vineyard, the environment, the area, the facilities, the architecture of the buildings, etc.). For each additional point in the assessment of this dimension, there is a 1.081 times greater probability of the visit being given a better overall evaluation. Among the control variables, the positive, significant effect of the overall assessment of the winery, which is, without a doubt, the most determinant variable of the visit experience. In addition, the length of the review had a negative effect on the evaluation, although the magnitude of the effect was small.

With regard to the effect of the variable related to whether the winery belongs to a wine route, results show that if the winery does not belong to a wine route, this increases the probability of a higher rating being given to the visit in comparison to wineries that do belong to a route (the omitted reference category) by 1.07 times, with all other variables being constant. This result is similar to the one reported above and shows that belonging to a wine route does not lead to an improvement in tourists' overall satisfaction. Although identifying the causes that could explain this result from the analysis is not possible, the wineries that are part of a wine route usually have to align themselves with certain expectations and common standards to maintain the coherence of the tourist offer of the wineries associated with the route. This can lead to a standardized or even repetitive experience for visitors who tour multiple wineries on the same route. By following a more rigid scheme, personalization in attention or activities may be lacking, which reduces the impact and authenticity of the experience. By contrast, independent wineries have greater freedom to innovate, adapt to the profile of each visitor, and offer a memorable and unique experience. In addition, wineries included in popular wine routes (e.g., "Rioja") may experience a greater flow of tourists, often leading to a more overcrowded experience. This can affect service quality because it can be difficult to maintain the same level of personalized attention when the volume of visits is high. Saturation can result in faster visits, less time to enjoy wine tasting, or less detailed attention from staff.

<Take in Table 4>

Finally, we present the results of the second ordinal logistic regression model (winery level) that allows an evaluation of the effects of the dimensions identified on the probability of rating the winery highly (Table 5). The likelihood ratio test confirms the preference for the estimated regression over the null model (the model that does not use predictors to explain the dependent variable) at a 99% confidence level (213.59, $p < 0.001$). The Nagelkerke pseudo-R-squared (0.506), Cox and Snell pseudo-R-squared (0.542), and McFadden rho (0.260) also indicate that the model has a suitable predictive power. Additionally, the VIFs do not exceed the threshold of 10 for any of the variables; thus, multicollinearity is not an issue that could bias the results of this regression. We find that the dimensions of "wine-making process" and "staff" remain statistically significant when we aggregate the data at the winery level, reinforcing the idea that these variables have a positive influence on the average rating of reviews for wineries visited by tourists. By contrast, the variable "Mercantile society" has a negative and statistically significant coefficient at the 1% level. This finding shows that the average rating of reviews for wineries incorporated as corporations or limited liability companies is lower than the average rating of reviews for other wineries (such as cooperatives). This effect seems to suggest that tourists' perceptions of how these types of wineries conduct their business operations may influence the level of satisfaction tourists feel when visiting a winery, which is reflected in the scores they assign in their reviews.

<Take in Table 5>

Finally, the variable related to being part of a wine route is not statistically significant when data are aggregated at the winery level (in contrast to the findings when the regression is estimated at the review level). This result may be due to the fact that aggregating data at the winery level reduces the granularity of the information, potentially smoothing out individual differences and nuances present in the review-level data. Moreover, the reputation of the individual wine routes matter because differences exist in the satisfaction perceived by tourists based on the route to which wineries belong. This situation may prevent the effect of being part of a wine route from reaching statistical significance in this regression.

Conclusions

The aim of this work is to analyze the dimensions that determine the wine tourist's experience when visiting a winery. In a novel approach, the work examines the influence of wine routes on this experience. An LDA analysis was applied to identify the dimensions that determine enotourists' wine tourism experiences. Subsequently, ordinal logistic regression analysis is conducted to identify the most determinant dimensions of tourists' assessments of their experiences and the influence of wine routes. The results indicated that the "staff" dimension, the treatment meted out by the person directing the visit, is the most determinant. In addition, the reputation of the wine route was considered to be a key factor.

The LDA analysis used in this work is an inductive approach based on the analysis of large amounts of unstructured text. This allowed the identification of the latent dimensions of the wine tourists' experiences based on their opinions of the activities performed in the wineries. In terms of management, many companies use marketing analytics into their decision-making and long-term strategies, given that they generate valuable results. The concept at the forefront of this technological and analytical change is "big data" (Haverila et al., 2024). Big data analytics focuses on data collection and detecting expressive patterns that obtain information useful for decision-making (Iacobucci et al., 2019).

One of the key findings of the present study is the underlining of the importance of the staff dimension, that is, the personnel who conduct the visits. Hanafiah (2022) evidenced the influence of tour guides and tourists' satisfaction on their intentions to revisit a destination and on the reputation of the destination. Undoubtedly, investing in the training of the staff who conduct wine tours is one of the determinant strategies for improving the visitor experience. This finding translates into a series of strategic imperatives for wineries, among which we can highlight the following: (i) training staff how to conduct immersive tours, providing them with specialized knowledge about wines, vineyard practices, and regional nuances, while enhancing customer service to strengthen guest–destination bonds; (ii) fostering a culture of hospitality among the winery staff, emphasizing warmth, attention, and personalized service to meet wine tourists' diverse needs and preferences; (iii) recognizing the fundamental role of tour guides in providing specialized education focused on the history of the winery and the world of wine; (iv) establishing robust feedback mechanisms to obtain information from wine tourists and iteratively improve service delivery processes; (v) exploring innovative technological solutions, such as interactive wine tasting applications and virtual tours to augment staff-led activities; and (vi) fostering collaborative networks with industry stakeholders (customers and competing

wineries) and educational institutions to access progressive knowledge and resources. By meticulously applying these strategies, wineries can improve visitors' wine tourism experiences and cultivate positive perceptions of their destinations, ensuring sustained visitor satisfaction, so that they would want to repeat their visits and recommend them to their friends and family. In addition, if these tourists are satisfied, they are likely to buy the wineries' products in the future (which, in the end, is the main commercial activity of these companies).

Thus, the results also indicated that belonging to a wine route does not necessarily improve an enotourist's experience. Despite the efforts made by wine routes to improve the quality of their enotourism offers, it is the wineries that ultimately provide the wine tourism services and, therefore, are ultimately responsible for complying with excellence and quality standards. However, the results indicated important differences in enotourists' assessments of their wine tourism experiences based on the specific route to which the winery belongs. Various managerial implications arise from this finding.

First, leaving aside any association with a wine route, it is the wineries themselves that, in their search for excellence in their enotourism services, must commit to create unforgettable experiences, imbued with authenticity, commitment, and quality. Some essential actions to achieve this are (i) cultivating a culture of excellence in their staff (where dedication, professionalism, and a customer-centric approach are the fundamental pillars), implementing continuous training and development programs aimed at improving customer service skills, wine knowledge, and the ability to create personalized and memorable experiences for visitors; (ii) establishing systematic processes for monitoring, evaluating, and improving the quality of enotourism services, using visitor feedback provided through surveys, reviews, and direct interactions, to identify areas of opportunity and address any shortcomings promptly; (iii) highlighting the vineyard's soil characteristics and offering wine tours/tastings that allow visitors to immerse themselves in the idiosyncratic features that make up the vineyard's identity to differentiate themselves from competitors by demonstrating the winemaking process; (iv) forging strategic alliances with local businesses, tourism organizations, and cultural institutions to enrich the visitor experience and expand the winery's appeal (through collaborative initiatives, such as wine and food pairing events, art exhibitions, and/or guided tours of nearby attractions); (v) capturing the tourist's attention and consolidate their own position as a leading wine tourism destination by integrating sustainable practices into the winery's tourism operations and activities and by developing comprehensive communication and marketing strategies to convey their value propositions effectively; and (vi) using digital platforms, social media, and experiential marketing campaigns to engage the target audience effectively and communicate the appeal of the tourism experience convincingly.

Second, wine routes, as DMOs, should take advantage of the information obtained from wine tourism experience assessments to design improvement plans that address any specific shortcomings identified. In this way, wine routes can make it attractive for wineries to come under their umbrella. To exert a positive impact on tourist satisfaction (not currently the case, according to our data), Spanish wine routes should collaborate with member wineries to implement specific improvements in service delivery and infrastructure and develop initiatives that attract visitors and raise awareness of the region's wine culture. In addition, to improve tourists' evaluations of their wine tourism experience, wine routes should develop structured benchmarking frameworks to compare the performance and best practices of wineries on the same route.

This work has some limitations that should be addressed. First, we examined wine routes in Spain. Given that we studied only one country, the conclusions may not be universally applicable. To overcome this limitation, future research may replicate the research in several countries, allowing cross-national comparisons of wine routes. Second, while TripAdvisor is one of the most popular tourism-focused review platforms, other increasingly popular review platforms (e.g., Google My Business) have attractive features that attract potential enotourists**;** thus, our analysis may not have addressed all wine tourism reviews. Third, given the data availability, we have not considered a dynamic perspective in the analysis. Future research should aim to analyze how tourists' valuations might change once a winery joins a wine route, comparing the tourists' valuation before and after a winery joins a route.

References

Alaei AR, Becken S, Stantic B (2019) Sentiment analysis in tourism: capitalizing on big data. *Journal of Travel Research* 58(2): 175-191.

Aletras N, Stevenson M (2013) Evaluating topic coherence using distributional semantics. In Proceedings of the 10th International Conference On Computational Semantics (IWCS 2013)–Long Papers (pp. 13-22).

Ali T, Omar B, Soulaimane K (2022) Analyzing tourism reviews using an LDA topic-based sentiment analysis approach. *MethodsX* 9, 101894.

Angelini A, Gilli A (2021) Customer experience can play a strategic role for wineries. *Journal of Business Strategy* 43(6): 391-396.

Annisa R, Surjandari I (2019) Opinion mining on Mandalika hotel reviews using latent dirichlet allocation. *Procedia Computer Science* 161: 739-746.

Barbierato E, Bernetti I, Capecchi I (2021) Analyzing TripAdvisor reviews of wine tours: An approach based on text mining and sentiment analysis. *International Journal of Wine Business Research* 34(2): 212-236. https://doi.org/10.1108/IJWBR-04-2021-0025

Ben-Tahar Y, Haller C, Massa C (2021) Business tourism in the wine sector: an exploratory study. *Journal of Wine Research* 32(4): 262-280.

Berger J, Packard G, Boghrati R, Hsu, M, Humphreys A, Luangrath A, et al.v(2022) Marketing insights from text analysis. *Marketing Letters* 33(3): 365-377.

Berry, LL, Parasuraman, A (2004) *Marketing services: Competing through quality*. Simon and Schuster.

Blei DM, Ng AY, Jordan MI (2003) Latent Dirichlet Allocation. *Journal of Machine Learning Research* 3: 993–1022.

Bosangit C, Hibbert S, McCabe S (2015) "If I was going to die I should at least be having fun": Travel blogs, meaning and tourist experience. *Annals of Tourism Research* 55: 1–14.

Brochado, A., Souto, J., Brochado, F. (2021b) Dimensions of sustainable tour experiences. *Journal of Quality Assurance in Hospitality and Tourism* 22(5): 625-648.

Brochado A, Stoleriu O, Lupu C (2021a) Wine tourism: a multisensory experience. *Current Issues in Tourism* 24(5): 597-615.

Brochado A, Troilo M, Rodrigues H, Oliveira-Brochado F (2020) Dimensions of wine hotel experiences shared online. *International Journal of Wine Business Research* 32(1): 59-77.

Bruwer J (2003) South African wine routes: Some perspectives on the wine tourism industry's structural dimensions and wine tourism product. *Tourism Management* 24(4): 423-435. https://doi.org/10.1016/S0261-5177(02)00105-X

Bruwer J, Alant K (2009) The hedonic nature of wine tourism consumption: An experiential view. *International Journal of Wine Business Research* 21(3): 235–257.

Caldwell N, Freire JR (2004) The differences between branding a country, a region and a city: Applying the Brand Box Model. *Journal of Brand Management* 12(1): 50-61. https://doi.org/10.1057/palgrave.bm.2540201

Çallı L, Çallı F (2023) Understanding airline passengers during covid-19 outbreak to improve service quality: topic modeling approach to complaints with latent Dirichlet allocation algorithm. *Transportation Research Record* 2677(4): 656-673.

Carlsen J, Boksberger P (2015) Enhancing consumer value in wine tourism. *Journal of Hospitality and Tourism Research* 39(1): 132-144.

Carmichael BA (2005) Understanding the wine tourism experience for winery visitors in the Niagara region, Ontario, Canada. *Tourism Geographies* 7: 185-204.

Charters S, Ali-Knight J (2002) Who is the wine tourist? *Tourism Management* 23(3): 311-319. https://doi.org/10.1016/S0261-5177(01)00079-6

Chen J, Becken S, Stantic B (2022) Assessing destination satisfaction by social media: An innovative approach using Importance-Performance Analysis. *Annals of Tourism Research* 93: 103371.

Cohen E, Ben-Nun L (2009) The important dimensions of wine tourism experience from potential visitors' perception. *Tourism and Hospitality Research* 9(1): 20–31.

Cronin JJ, Brady MK, Hult GTM (2000) Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing* 76(2): 193–218. https://doi.org/10.1016/S0022-4359(00)00028-2

Famularo B, Bruwer J, Li E (2010) Region of origin as choice factor: Wine knowledge and wine tourism involvement influence. Int*ernational Journal of Wine Business Research* 22(4): 362-385. https://doi.org/10.1108/17511061011092410

Gao D, Xia H, Deng W, Muskat B, Li G, Law R (2022) Value creation in wine tourism – an exploration through deep neural networks, *Journal of Vacation Marketing* 30(3): 376-391.

Gao S, Tang O, Wang H, Yin P (2018) Identifying competitors through comparative relation mining of online reviews in the restaurant industry. *International Journal of Hospitality Management* 71: 19–32.

García-Méndez S, de Arriba-Pérez F, Barros-Vila A, González-Castaño FJ, Costa-Montenegro E (2023) Automatic detection of relevant information, predictions and forecasts in financial news through topic modelling with Latent Dirichlet Allocation. *Applied Intelligence* 53(16): 19610-19628.

Gatti S, Incerti F (1997) The Wine Routes as an Instrument for the Valorisation of Typical Products and Rural Areas (52nd Seminar, June 19-21, 1997, Parma, Italy No. 231431) *European Association of Agricultural Economists*. Available at: https://econpapers.repec.org/paper/agseaae52/231431.htm

Getz D (2000) *Explore wine tourism: Management, development and destinations*. Cognizant Communication. Elmsford, USA.

Getz D, Brown G (2006) Critical success factors for wine tourism regions: A demand analysis. *Tourism Management* 27(1): 146-158. https://doi.org/10.1016/j.tourman.2004.08.002

Getz D, Carlsen J (2008) Wine tourism among generations X and Y. *Tourism* 56(3): 257–270.

Gilmore JH, Pine BJ II (2002) Differentiating hospitality operations via experiences: Why selling services is not enough. *Cornell Hotel and Restaurant Administration Quarterly* 43(3): 87–96.

Gómez M, Lopez C, Molina A (2015) A model of tourism destination brand equity: The case of wine tourism destinations in Spain. *Tourism Management* 51: 210-222.

Guo Y, Barnes SJ, Jia Q (2017) Mining meaning from online ratings and reviews: Tourist satisfaction analysis using latent dirichlet allocation. *Tourism Management* 59: 467-483.

Gurrib I, Kamalov F (2022) Predicting bitcoin price movements using sentiment analysis: a machine learning approach. *Studies in Economics and Finance* 39(3): 347-364.

Hall CM, Johnson G, Cambourne B, Macionis N, Mitchell R, Sharples L (2000) Wine tourism: An introduction. In Hall, CM, Sharples L, Cambourne B, Macionis N (Eds.): *Wine tourism around the world: Development, management and markets* (pp. 1–23) Oxford: Elsevier Science Ltd.

Hall C, Mitchell R (2002) The tourist terroir of New Zealand wine: The importance of region in the wine tourism experience. *Food and Environment: Geographies of Taste* 69-91.

Haverila K, Haverila M, Rangarajan A (2024) The impact of the decision-making role on perceived satisfaction, value for money, and reinvest intentions at varying levels of perceived financial performance in the context of Big Data Marketing Analytics. *Journal of Marketing Theory and Practice* 1-21.

Hensher DA, Johnson LW (2018) *Applied discrete-choice modelling*. Routledge.

Hojman DE, Hunter-Jones P (2012) Wine tourism: Chilean wine regions and routes. *Journal of Business Research* 65(1): 13-21. https://doi.org/10.1016/j.jbusres.2011.07.009

Iacobucci D, Petrescu M, Krishen A, Bendixen M (2019) The state of marketing analytics in research and practice. *Journal of Marketing Analytics* 7(3): 152-181.

Kastenholz E, Cunha D, Cunha C, Barroco C, Pereira A, Carneiro MJ, Lane B (2022) COVID-19, wine routes, crisis management and resilience amongst rural wine tourism businesses. *Advances in Hospitality and Tourism Research (AHTR)* 10(1): 1-26.

Kuo YF, Wu CM, Deng WJ. (2009) The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior* 25(4): 887–896. https://doi.org/10.1016/j.chb.2009.03.003

Leri I, Theodoridis P (2021) How do personality traits affect visitor's experience, emotional stimulation and behaviour? The case of wine tourism. *Tourism Review* 76(5): 1013-1049. https://doi.org/10.1108/TR-05-2019-0148

Li J, Feng Y, Li G, Sun X (2020) Tourism companies' risk exposures on text disclosure. *Annals of Tourism Research* 84: 102986.

Li AH, Ma L (2020) Charting the path to purchase using topic models. *Journal of Marketing Research* 57: 1019–1036.

Li Z, Yuan F, Zhao Z (2024) Robot restaurant experience and recommendation behaviour: based on text-mining and sentiment analysis from online reviews. *Current Issues in Tourism* 1-15.

Mariani M, Baggio R (2022) Big data and analytics in hospitality and tourism: a systematic literature review. *International Journal of Contemporary Hospitality Management* 34(1): 231-278.

Marzo-Navarro M, Pedraja-Iglesias M (2010) Are there different profiles of wine tourists? An initial approach. *International Journal of Wine Business Research* 22(4): 349-361. https://doi.org/10.1108/17511061011092401

McColl-Kennedy J, Schneider U (2000) Measuring customer satisfaction: why, what and how. *Total Quality Management* 11(7): 883-896.

Meneses R, Brito C, Lopes B, Correia R (2023) Satisfaction and dissatisfaction in wine tourism: A user-generated content analysis. *Tourism and Hospitality Research* 14673584231191989.

Miner AS, Stewart SA, Halley MC, Nelson LK, Linos E (2023) Formally comparing topic models and human-generated qualitative coding of physician mothers' experiences of workplace discrimination. *Big Data and Society* 10(1): 20539517221149106.

Mirzaalian F, Halpenny E (2021) Exploring destination loyalty: Application of social media analytics in a nature-based tourism setting. *Journal of Destination Marketing and Management* 20: 100598.

Nicolau JL, Sharma A (2022) The role of information and choice under uncertainty. In Croes, R. and Yang, Y. (Eds.): *A Modern Guide to Tourism Economics* (pp. 116-133) Edward Elgar Publishing.

Oyinseye P, Suárez A, Saldaña E, Fernández-Zurbano P, Valentin D, Sáenz-Navajas MP (2022) Multidimensional representation of wine drinking experience: Effects of the level of consumers' expertise and involvement. *Food Quality and Preference* 98: 104536.

Penagos-Londoño GI, Ruiz-Moreno F, Sellers-Rubio R, Del Barrio-García S, Casado-Díaz AB (2022) Consistency of expert product reviews: An application to wine guides. *Wine Economics and Policy* 11(2): 51-60.

Pikkemaat B, Peters M, Boksberger P, Secco M (2009) The staging of experiences in wine tourism. *Journal of Hospitality Marketing and Management* 18(2/3): 237–253.

Pine BJ II, Gilmore JH (1999) *The experience economy: Work is theatre and every business a stage*. Boston, MA: Harvard Business School Press.

Qi X, Chang W, Liu A, Sun J, Fan M (2024) Exploring the influence of emotionality and expertise on online wine reviews: does greater knowledge lead to less review? *International Journal of Contemporary Hospitality Management* 36(8): 2842-2869.

Quadri-Felitti DL, Fiore AM (2013) Destination loyalty: Effects of wine tourists' experiences, memories, and satisfaction on intentions. *Tourism and Hospitality Research* 13(1): 47–62.

Quadri-Felitti D, Fiore A (2016) Wine tourism suppliers' and visitors' experiential priorities. *International Journal of Contemporary Hospitality Management* 28(2): 397–417.

Ryoo JH, Wang X, Lu S (2021) Do spoilers really spoil? Using topic modeling to measure the effect of spoiler reviews on box office revenue. *Journal of Marketing* 85: 70–88.

Sellers R, Nicolau JL (2023) Satisfaction and expenditure in wineries: A prospect theory approach. *Journal of Hospitality and Tourism Research* 47(2): 354-374.

Sheth J (2021) New areas of research in marketing strategy, consumer behavior, and marketing analytics: the future is bright, *Journal of Marketing Theory and Practice* 29(1): 3-12.

Shin S, Du Q, Ma Y, Fan W, Xiang Z (2021) Moderating effects of rating on text and helpfulness in online hotel reviews: An analytical approach. *Journal of Hospitality Marketing & Management* 30(2): 159–177.

Shin S, Nicolau JL (2022) Identifying attributes of wineries that increase visitor satisfaction and dissatisfaction: Applying an aspect extraction approach to online reviews. *Tourism Management* 91: 104528.

Sparks B (2007) Planning a wine tourism vacation? Factors that help to predict tourist behavioural intentions. *Tourism Management* 28(5): 1180-1192.

Syakier WA, Hanafiah MH (2022) Tour guide performances, tourist satisfaction and behavioural intentions: a study on tours in Kuala Lumpur city centre. *Journal of Quality Assurance in Hospitality and Tourism* 23(3): 597-614.

Taecharungroj V, Mathayomchan B (2019) Analysing TripAdvisor reviews of tourist attractions in Phuket, Thailand. *Tourism Management* 75, 550-568.

Thanh TV, Kirova V (2018) Wine tourism experience: A netnography study. *Journal of Business Research* 83: 30-37.

Thomas B, Quintal VA, and Phau I (2018) Wine Tourist Engagement With the Winescape: Scale Development and Validation. *Journal of Hospitality and Tourism Research* 42(5): 793-828. https://doi.org/10.1177/1096348016640583

Tirunillai S, Tellis GJ (2014) Mining marketing meaning from online chatter: Strategic brand analysis of big data using latent Dirichlet allocation. *Journal of Marketing Research* 51(4): 463-479.

Wang J, Li Y, Wu B, Wang Y (2021) Tourism destination image based on tourism user generated content on internet. *Tourism Review* 76(1): 125-137.

Wang Y (2017) *More important than ever: Measuring tourist satisfaction*. Griffith Institute for Tourism Research Report No. 10. Available at: https://www.griffith.edu.au/__data/assets/pdf_file/0012/898176/Measuring-Tourist-Satisfaction.pdf.

Wilk V, Soutar GN, Harrigan P (2019) Tackling social media data analysis: Comparing and contrasting QSR NVivo and Leximancer. *Qualitative Market Research: An International Journal* 22(2): 94-113.

Wu DC, Cao C, Wu J, Hu M (2024) Wine tourism experiences of Chinese tourists: a tourist-centric perspective. *International Journal of Contemporary Hospitality Management* 36(8): 2601-2631.

Wu DC, Zhong S, Qiu RT, Wu J (2022) Are customer reviews just reviews? Hotel forecasting using sentiment analysis. *Tourism Economics* 28(3): 795-816.

Yadav N, Verma S, Chikhalkar R (2024) Online reviews towards reducing risk. *Journal of Tourism Futures* 10(2): 299-316.

Zinko R, Ferris GR, Blass FR, Dana-Laird M (2007) Toward a theory of reputation in organizations. In *Research in personnel and human resources management* (pp. 163-204) Emerald Group Publishing Limited.

Table 1. Dimensions identified

Dimension/Topic	Prevalence	Coherence	Most frequently used terms
T1. Tangibles	15.587	0.069	wine, views, vineyard, surroundings, buildings, Rioja, area, facilities, museum, castle, architecture, charm, village, riverside, art
T2. Value-for-money	14.362	0.086	wine, quality, price, bottle, taste, shop, buy, product, recommend, tasting, cava, wine tasting, taste, experience, repeat
T3. Group experience	17.629	0.084	group, friends, experience, people, eat, restaurant, food, site, family, people, couple, repeat, area, hotel, Saturday
T4. Wine-making process	15.972	0.155	wine, process, production, history, explanation, wine-making, tasting, barrel room, vineyard, guide, cava, facilities, vineyard
T5. Tasting–sampling	17.341	0.183	wine, tasting, wine tasting, sampling, white, food, red, cheese, tasting, wine tasting, reservation, white wine, glass, menu, guided
T6. Staff	19.108	0.109	staff, guide, explanation, treatment, wine, experience, personal, attention, familiar, professional, passion, tasting, charm, guides, family

Table 2. Sentiment analysis of the identified dimensions

	T1. Tangibles	T2. Value for money	T3. Group experience	T4. Wine-making process	T5. Tasting–sampling	T6. Staff
Mean	1.965	1.787	1.170	1.864	2.063	3.002
SD	2.860	2.880	3.008	2.672	2.947	3.140
max	20	20	24	21	22	23
min	−9	−19	−32	−8	−15	−9
%age of reviews that included the dimension	35.87%	33.36%	38.26%	37.80%	43.10%	50.18%

Table 3. Sentiment assessment of the dimensions identified on the basis of whether the winery belonged to a wine route

WR		T1. Tangibles	T2. Value for money	T3. Group experience	T4. Wine making process	T5. Tasting–sampling	T6. Staff
No	**Mean**	1.994	1.831	1.157	1.826	2.123	2.949
	SD	2.912	2.924	2.997	2.640	3.026	3.161
	max	18	19	20	19	21	21
	min	−9	−13	−32	−5	−15	−7
	N	4845	4578	5359	4754	5811	6476
Yes	**Mean**	1.947	1.759	1.178	1.886	2.026	3.033
	SD	2.827	2.852	3.015	2.689	2.896	3.128
	max	20	20	24	21	22	23
	min	−8	−19	−18	−8	−11	−9
	N	7796	7178	8123	8567	9379	11207
Diff.	*t* (sig.)	0.894 (0.371)	1.332 (0.183)	-0.409 (0.683)	-1.229 (0.219)	1.972 (0.049)	-1.705 (0.088)

Table 4. Estimation of the ordinal logistic regression model (tourist review level).

				95% Wald confidence interval for Exp(B)		
	Beta	SD	Sig.	Exp (Beta) Odds Ratio	CI lower	CI upper
T1. Tangibles	0.078	0.007	0.000	1.081	1.067	1.095
T2. Value for money	0.082	0.007	0.000	1.086	1.071	1.101
T3. Group experience	0.109	0.007	0.000	1.116	1.101	1.131
T4. Wine-making process	0.081	0.007	0.000	1.084	1.070	1.099
T5. Tasting-sampling	0.083	0.006	0.000	1.086	1.074	1.099
T6. Staff	0.157	0.006	0.000	1.171	1.157	1.184
Winery Reputation (% of rating 4 and 5)	0.121	0.002	0.000	1.128	1.125	1.132
Length of the review	-0.001	4.56E-5	0.000	0.999	0.999	0.999
[WR_dummy=0]	0.055	0.026	0.033	1.057	1.004	1.111
[WR_dummy=1]	0	.	.	1	.	.

Table 5. Estimation of the ordinal logistic regression model (winery level)

				Confidence interval for Beta	
	Beta	SD	Sig.	CI lower	CI upper
T1. Tangibles	−0.203	0.124	0.103	−0.446	0.041
T2. Value for money	−0.011	0.076	0.884	−0.160	0.138
T3. Group experience	0.038	0.138	0.784	−0.233	0.309
T4. Wine-making process	0.215	0.083	0.010	0.052	0.378
T5. Tasting–sampling	0.042	0.090	0.638	−0.134	0.218
T6. Staff	0.154	0.056	0.006	0.044	0.265
Winery size	−0.111	0.095	0.241	−0.298	0.075
Winery age	−0.008	0.006	0.196	−0.021	0.004
Commercial company	−1.227	0.515	0.017	−2.236	−0.217
[WR_dummy = 0]	−0.153	0.271	0.573	−0.684	0.379
[WR_dummy = 1]	.	.	.	.	.