

Post-visit and pre-visit tourist destination image through eWOM sentiment analysis and perceived helpfulness

Tourist
destination

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Abstract

Purpose – This paper aims to explore the image of travel destinations after the visit by analysing sentiment orientation of the online reviews, and how this orientation, as well as other electronic word of mouth (eWOM)'s credibility sources, can affect the perceived helpfulness of shared opinions measured through the helpfulness score.

Design/methodology/approach – Tourist destinations are increasingly affected by travel-related information shared through the Web. More and more people first check the previous travel experiences of other people to build their own destination image and to help them in their choice of destination. This paper analyses the shared opinions related to the city of Barcelona in a well-known eWOM website. The reviewers' opinion and the credibility sources of eWOM are extracted from the web using a webscraper, while the sentiment score to analyse the discourse orientation (positive vs negative) is calculated using computer-based sentiment analysis techniques.

Findings – Online reviews' users are reluctant to provide extreme polar opinions (very negative, very positive) to any travel subcategory (hotel, restaurant, attractions and night-life) of a tourist destination. The results obtained also reveal that eWOM's perceived helpfulness grows with the expertise of the reviewer. However, the helpfulness score given to the reviews posted is not influenced by the sentiment orientation of the author's opinion.

Research limitations/implications – This research is limited to the case study of Ciao, which is a well-known consumer platform, and the city of Barcelona, which is a top touristic destination. However, the approach proposed can be easily extended to other similar consumer platforms and cities using the same methodology.

Practical implications – Understanding the information posted in the media environment is a major concern in the field of marketing destination planning. Positive and negative eWOM offers potential consumers a clear picture on the tourist destination, and this information can be used by Destination Marketing Organisations to meet customers' needs and expectations. The perceived helpfulness of reviews analysed in this paper can also help practitioners and scholars to understand those factors that make reviews more trustworthy.

Originality/value – From a methodological point of view, the main contribution of this research is the utilisation of an unstructured approach to the measurement of the destination image based on the



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sentiment analysis of shared opinions. From a theoretical point of view, the study relates the post-visit destination image with the pre-visit image formation process, using the sentiment orientation of the former and the perceived helpfulness of the latter.

Keywords Information technology, Brand image, Customer orientation, Information systems, Information gathering

Paper type Research paper

1. Introduction

It is commonly accepted that the destination image is important for any tourist destination loyalty and that it highly influences tourist destination choices and the future purchase intentions (Bigné and Sánchez, 2001; Gursoy *et al.*, 2014). Several stages can be distinguished regarding tourists' behaviour: pre-visit destination choice, onsite experience and the experience evaluation (in terms of travel quality – service and experience – and perceived value), and finally, post-visit actions such as intention to revisit and willingness to recommend the tourist destination (Chen and Tsai, 2007).

Prior to visit, destination image is a fundamental concept to understand the tourist destination choice (Tham *et al.*, 2013). As recognised in the academic literature, the choice of a particular destination over others is influenced by more positive and stronger destination image (Gartner, 1994). Gartner (1994) identifies three information sources on the image destination formation process: induced agents or information sources not provided by tourists but by the destination (guidebooks, magazine articles), organic agents or information (either solicited or unsolicited) provided by friends and family, the so-called word of mouth (WOM), and the real experience at the destination.

Studies in tourism have demonstrated the high influence of WOM in the destination image and therefore in the destination choice due to its high level of perceived credibility over the induced information sources (Brown and Getz, 2005; Litvin *et al.*, 2008). WOM refers to a face-to-face information exchange, but it has evolved to a more impersonal but more pervasive form of WOM, the so-called electronic word of mouth (eWOM), based on technology information advances and the growing access to the internet (Law *et al.*, 2014; Kim *et al.*, 2015).

Online communities have encouraged the interactions of travellers, who share experiences and opinions through an increasing number of posted reviews. They consider not only the product quality but also the quality of the experience (Cheung *et al.*, 2008; Sigala, 2008; Dwivedi, 2009). As a result, online travel communities represent a reliable source of information for the destination choice (Shang *et al.*, 2006), which complement both the external information face-to-face from family, friends and experts and the internal information based on memory evoking past experience (Lee *et al.*, 2015).

In tourism, online reviews provide travellers with an easy way to find information on a destination without the restrictions of time and space (Shimakukuro Sandes and Torres Urdan, 2014). However, the abundance and variety of online information is also challenging and can hinder the assimilation and processing of such a high amount of information by potential readers (Xiang and Gretzel, 2010; Olmedilla *et al.*, 2015). The utility of WOM and eWOM on building the destination image depends on their credibility. While the credibility on traditional WOM is mainly based on face-to-face communication and therefore it largely depends on the relationship the person has with the communicator of the experience, the credibility on eWOM appears to be more

subjective and requires seeking more attributes to be trusted than those in traditional WOM. In some online communities such as Ciao and TripAdvisor, the perceived utility of eWOM can be obtained from the “helpfulness” score given to a certain review (Arenas-Marquez *et al.*, 2014). The helpfulness score is associated to credibility and can help other users to create their own pre-visit destination image and decide whether or not to visit a tourist destination.

Online reviews play a dual role (Park *et al.*, 2007) by providing information on a tourist destination image: on the one hand, they provide information about the post-visit destination image based on the reviewers’ posted experiences; on the other hand, they also provide a recommendation to potential tourists so that they can create their own pre-visit destination image. In this sense, this paper attempts to understand the relevance of eWOM for those organisations responsible for marketing destinations and for potential travellers willing to obtain information related to the main attributes of a tourism destination (Phillips *et al.*, 2013; Serra Cantallops and Salvi, 2014) considering also the quality of the reviews.

However, online comments represent an unstructured information source difficult to analyse, requiring high cognitive and time costs if done manually. To overcome this difficulty, the paper analyses the reviews by applying computer-based sentiment analysis techniques able to identify the semantic orientation on different attributes of a destination. The results might help potential tourists to build their own destination image before the visit and Destination Marketing Organisations (DMOs) to know the dominant discourse (positive versus negative) of the experience for travellers so that they can improve the service quality and the experience quality of a destination to attract potential visitors in the pre-visit stage and to favour loyalty in post-travel stage (recommendation and revisit).

The high number of travel reviews and the difficulties to judge the quality of a review makes the potential tourist to trust the helpfulness score of posted reviews as a mechanism to reduce uncertainty when building an accurate destination image. Academic literature identifies different sources of credibility for online reviews: reviewers’ expertise and trustworthiness (Liu, 2006; Zhu and Zhang, 2010) and valence of the reviews (positive versus negative) (Sen and Lerman, 2007). However, the influence of these factors on the perceived helpfulness of online reviews is still under researched in tourism literature. Thus, the present study attempts to go deeper by analysing the marginal contribution of the credible sources on the perceived helpfulness of the reviews for a tourist destination. Furthermore, the study analyses whether the reviewer’s subjectivity, in terms of the positive versus negative discourse (review valance), influences the perceived helpfulness of online reviews.

The structure of the paper is as follows: Section 2 presents previous studies about the measurement of a tourism destination image from the most traditional approaches to those based on the emergence of a new paradigm in the image formation process with the advent of the Web 2.0. The relevance of eWOM revealing consumer insights on a tourism destination and its influence on the destination image formation process based on its credibility is also analysed in Section 2. Section 3 describes the case study, the data collection and the methodology for calculating the sentiment score of the reviews as well as the model to explain the eWOM’s perceived helpfulness. Obtained results are shown in Section 4, and, finally, Section 5 concludes the paper.

2. Related work

2.1 *Tourist destination image*

The tourist destination image is one of the most studied topics in the tourism literature (Fakeye and Crompton, 1991; Tapachai and Waryszak, 2000). Many authors agree on its ability and power to influence not only a customer's perception of a tourist destination (Tuohino and Pitkänen, 2004) and, accordingly, the selection of a holiday destination, but also the destination loyalty (revisit and recommendation) after the visit. The literature review on the destination image provides heterogeneous approaches to this topic. From the seventies to the present, different contributions on the concept of the destination image (Hunt, 1975; Coshall, 2000; Kim and Richardson, 2003), its dimensions (Echtner and Ritchie, 1993) and factors determining the destination image formation have been analysed (Baloglu and McCleary, 1999).

As noted by Bigné and Sánchez (2001), the image concept has been generally associated either with the mental representation of beliefs, feelings and global impressions of a tourist destination (Kim and Richardson, 2003) or with the global perception about a tourist destination (Hunt, 1975; Tapachai and Waryszak, 2000). Dichter (1985) already recognised the image as a global impression of a destination, which in turn is made up by evaluating both the cognitive and the affective attributes. The complementarity of the cognitive and the emotional components to form the overall image of a tourist destination is introduced in several studies (Yoon and Kim, 2000; Sotiriadis, 2015).

According to Baloglu and McCleary (1999), the image formation process is influenced by personal and stimuli factors. Personal factors are referred to as psychological traits (motivation, values, personality), also known as push factors (Mayo and Jarvis, 1981; Hui and Wan, 2003) and social characteristics such as education, age, among others (Woodside and Lysonski, 1989). The external factors include previous experience although not absolutely necessary in the image formation process (Fakeye and Crompton, 1991), and various information sources (Baloglu and McCleary, 1991; Coshall, 2000), such as symbolic stimuli (promotional efforts through social media) and social stimuli (WOM) (Um and Crompton, 1990).

Based on the information sources of a destination, Gunn (1972) made a clear difference between organic and induced images. While organic images are formed with no tourist information sources (books, school education, television documentaries), induced images are associated with the promotional marketing efforts of a destination (guidebooks, TV promotions, magazine articles). From this classification, Gartner (1994) identified eight image formation agents: induced Agents I (traditional tourist promotional materials), induced Agents II (tour operators, travel agencies); induced Agents III (traditional publicity); induced Agents IV (travel section articles, newspapers); autonomous (films, news, television documentaries), unsolicited organic (friends and family information, not sought), solicited organic (information sought from friends and family) and organic image (actual visitations).

Researchers have shown that the exposure to travel information mainly influences the cognitive images and/or the overall image, and it can therefore modify the destination image of a potential tourist (Woodside and Lysonski, 1989; Baloglu and McCleary, 1999; Beerli and Martin, 2004; Gursoy *et al.*, 2014). Multi-attribute approaches have been recently complemented by the utilisation of online information sources. The influence of eWOM-shared opinions and experiences on brand image was concluded in the study by Stokes and Lomax (2002). More evidence can be found in the study by

Hanlan and Kelly (2004), where the destination image formation is defined as a multi-stage process starting with the initial image created by consumers. The right understanding of online information sources is today key for DMOs and entrepreneurs that require efficient and innovative marketing strategies.

2.2 Online reviews' impact on destination image

With the rapid and growing development of Web 2.0 and the free availability of online narrative and visual contents, recent works have studied the role of online information sources, leading to a new paradigm in the image formation process (Govers and Go, 2003; Choi *et al.*, 2007). The relevance of Web 2.0 applications on the pre-visit destination image is manifested in the observed shift from the business-to-consumer marketing to the consumer-to-consumer model to obtain and share information. Online travel communities (e.g. TripAdvisor, Ciao), blogs and forums (e.g. travelblog.org, travepod.com, lonelyplanet.com) incite people to share opinions and experiences about many different destinations to help potential travellers with the right destination choice. Some empirical evidence of the relevance of Web 2.0 for the purpose of searching online tourist information can be drawn from the Tourism Economics reports (Tourism Economics, 2013): focusing on European economies, half of all travellers reveal the use of internet sites and social media for travel information; nearly 40 per cent of all households (and nearly half of all internet users) use the internet for tourism purposes; and 34 per cent of European travellers reported that their travel decision was influenced by online reviewers' opinion. The recommendations of friends and relatives (WOM) appear to be most relevant information resource followed by user-generated content (UGC). However, the relevance of eWOM becomes higher as more personal interaction occurs online. Aware of the implementation of new technologies, institutions specialised in tourism have increasingly incorporated in their official websites interactions with social media to encourage UGCs, digital cartography and other services (audio guide, podcast, etc.) to promote a tourist destination (Öz, 2015). Examples can be found in the official Australian tourism website and England tourism website, which are incorporating blogs and UGC into marketing strategies.

Exposure to positive and negative comments on the web has a clear impact on destination image formation before visit (Gretzel *et al.*, 2005) and also offers Destination Marketing Planners (DMP) with consumer insights on satisfaction in a holiday destination. The information on the web is unstructured and therefore difficult to process and judge. As a result, the tourist literature is starting to focus on the content of shared reviews using sentiment analysis techniques to understand the online discourse (positive oriented vs negative oriented) in eWOM (Haruechaiyasak *et al.*, 2010). Collecting opinions on the Web requires processing XML files to capture the desired information, and the identification of the sentiment orientation requires some computational methods to deal with hundreds of opinions that are available through the Web. On the other hand, the helpfulness score given to a posted review provides readers with indications about the credibility of the online information source as valuable to build the destination image and to decide on the destination choice.

2.2.1 Sentiment analysis. The aim of sentiment analysis is to detect and classify the sentiments expressed by a speaker or writer. Sentiment analysis, also known as opinion mining, summarises a large amount of data to identify sentiment polarity to make the online-generated content easier to process and understand. There are two main approaches

to extract sentiments automatically. The first one is the lexical-based approach, and it is based on calculating the semantic orientation for a posted review by determining whether the sentences in eWOM express positive or negative feelings. This approach typically considers a dictionary of opinion words classified in different categories expressing a specific sentiment. The second is the machine learning approach, which makes use of supervised classification methods using a previously annotated corpus of text (Ortigosa *et al.*, 2014). Although machine learning techniques can generate models fitting specific contexts, their main disadvantage is the requirement of annotated data that can compromise the applicability of these methods in wider contexts.

DMPs are gradually using sentiment analysis to obtain information about the holiday destination image provided by visitors to develop accurate marketing strategies to increase destination loyalty. Sentiment analysis provides visitor insights related to what they think or feel on different tangible attributes of a destination and also on the perceived value and quality of the experience in a holiday destination. Sentiment analysis helps DMPs to identify not only complaints related to service quality, perceived value and quality of experience in a holiday destination but also provides insights on new tourism business opportunities; at the same time, it helps to implement managerial actions accordingly to improve destination loyalty.

2.2.2 Online review information helpfulness and its credibility sources. Perceived usefulness was introduced by Technology Acceptance Model and was defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis 1989, p. 320). Within the technological context, perceived usefulness is a key predictor for user adoption. With the development of virtual platforms, individuals share opinions about product and services, which undoubtedly influence the perception of how useful or valuable these opinions are to make a better buying decision. Thus, Sussman and Siegal (2003) admit that the perceived usefulness construct can be applied to information and communication context, to be referred as information usefulness. In this regard, information usefulness, defined in terms of valuable, informative and helpful comments (Baley and Pearson, 1983), appears as a fundamental predictor of information adoption. In the online consumer reviews literature, both the perceived usefulness and the perceived helpfulness of a review are used interchangeably and interpreted as measures of information usefulness in the purchase decision making (Willemssen *et al.*, 2011). In general, the perceived helpfulness appears in studies related to virtual platforms where “helpful votes” appear as information usefulness; while the perceived usefulness is used for virtual platforms that display “useful votes” as information usefulness.

Travel virtual communities provide information not only about the post-visit destination image offered by UGC, but also about the quality of the online information provided, helping others to trust that information and consequently to build the pre-visit destination image. The quality of the information in virtual communities is guaranteed by the peer evaluation in terms of online helpfulness score (to what extent a review is helpful) given by other community members (King *et al.*, 2014). Academic literature suggests that the high influence of WOM on image formation process is due to its high credibility (Gartner, 1994; Tasci and Gartner, 2007). While credibility on WOM is mainly based on communicator expertise, credibility on eWOM is not as clear as in WOM due to the impersonal relations established on the web. Thus, the image formation process via eWOM is a complex phenomenon, which depends on its credibility. The identification of

the factors, which influences the evaluation of an online review in terms of helpfulness, is a step forward to understand that complex phenomenon.

The reviewer's expertise is assessed as a source of review credibility and considered as a key mechanism to reduce the uncertainty of the user's reviews (Casaló *et al.*, 2008; Kucukusta *et al.*, 2015). Generally speaking, expertise is defined as "the extent to which the source is perceived as being capable of providing correct information" (Bristor, 1990 p. 73). The degree of expertise is related to the sender of WOM message's training or experience in a particular field (Racherla and Wesley, 2012). However, in online forums, and particularly in the hospitality and tourism sector, where products are more experience-orientated, information seekers do not look for professional knowledge but rather recommendations from consumers with actual experience on those products. Thus, reviewers' comments appear to be more persuasive than the comments offered by experts. In the context of a virtual platform where the consumer face impersonal text-based resource, the present study, which is based on the research of Wu (2014) for assessing the expertise of reviewers, uses two indicators for reviewers' expertise: number of reviews posted and permanence (duration) on the platform; while other studies focus only on the number of previous reviews written by the reviewer (Weiss *et al.*, 2008; Racherla and Wesley, 2012):

H1. The eWOM perceived helpfulness is positively influenced by the expertise of the reviewer: previous reviews (contribution) and membership (permanence).

The review length (measured as the word count) is also a factor helping consumers to notice the features of the product or service under evaluation without additional search costs (Gupta and Harris, 2010). Reviewers with a great knowledge on a product or service are likely to write a more comprehensive and more detailed review, which can be translated into the extensiveness of the review (Mitchel and Dacin, 1996). According to Chevalier and Mayzlin (2006), reviewers who post high amount of textual information are perceived as enthusiastic reviewers by making a great effort to identify the pros and cons of the product or service. Previous studies admit that extensiveness of a review increases the reviewer's credibility by helping consumers to assess the attributes of the products and, therefore, influencing the perceived helpfulness of the review and the purchase decision (Gupta and Harris, 2010):

H2. Reviews providing a higher amount of information are perceived as more helpful than reviews using fewer words.

Scholarly literature has also explored the influence of review valence on the perceived helpfulness (Dellarocas *et al.*, 2004). Some studies reveal that consumers tend to weigh negative reviews more than positive reviews while making a purchase decision (Basuroy *et al.*, 2003; Chevalier and Mayzlin, 2006). However, other studies in eWOM demonstrate that negative reviews are not more helpful than the positive ones. For instance, a well-written and detailed review also influences its perceived helpfulness (Wu, 2013). These studies measure review valence through the consumer opinion using a 1-star to 5-star rating. Nevertheless, no studies so far have analysed the effect of review sentiment orientation on the perceived helpfulness. Virtual communities such as ciao.com recommend the registered members to rate the comments through the helpfulness score in a way that the ratings given by the readers should not be influenced by the degree of agreement or disagreement with the eWOM author's opinion:

H3. Perceived helpfulness of eWOM does not depend on the semantic orientation of the online comments.

3. Methodology

3.1 Data collection

Data were collected from the eWOM site Ciao, which is a well-known online community where users can freely post reviews and rates millions of products and services. It is one of the largest shopping portals in Europe (www.ciao.co.uk), with 1.3 million members that wrote more than 7 million reviews about 1.4 million of products. The website is structured in 28 main categories, and one of them is the category “Travel”. Starting in this category, reviews can be selected by continents, countries and cities. The city of Barcelona was chosen as a case study because Barcelona is one of the top tourist destinations in Europe. In 2014, the city of Barcelona as a tourist destination was 24th of the top 25 city destinations according to cntraveler.com and eromonitor.com. Essentially, Ciao distinguishes four areas of interest when visiting a city: Hotels, Attractions, Restaurants and Pubs, Bars & Nightlife. Registered users can freely post reviews within any of these subcategories, and posted reviews can also be scored by the rest of the community, this information being publicly available. The perceived helpfulness of eWOM within the Ciao community is measured by the ratings received by reviewers. These ratings determine how helpful the readers find the reviews, and allow other community members to easily locate the most helpful reviews to make the best decision about a product or service. Thus, reviews with an average rating of “exceptional” or “very helpful” are displayed at the top of the list and help others to choose among a great variety of online reviews.

Finally, users’ statistics are also publicly displayed, such as the registration date, the previous experience as a reviewer or the trust score given by other community members. Both users’ statistics and the body of reviews can be collected using a webscraper developed in R ([Martinez-Torres, 2013](#)). The HTML code can be read using the function `readLines()` from the base package of R. However, the HTML code contains not only the information of interest but also the HTML tags. To avoid these tags and to extract the information of interest, the function `htmlParse()` can generate an R structure containing the HTML tree. By using regular expressions, supported in R in packages like *XML* ([Martinez-Torres, 2015](#)), the meaningful information can be finally extracted. [Table I](#) details the collected information.

Table I.
Information
extracted from
reviews posted in the
category travel →
Spain → Barcelona

Variable	Description
Text	Body of the review
Size	Size of reviews measured in words
User	Alias and link to the user statistics webpage
Date	Registration date as a member of Ciao
Reviews	Number of previously posted reviews
Trust	Members who specifically trust this user
Subcategory	Hotels, Attractions, Restaurants, Pubs_Bars_Nightlife

3.2 Sentiment analysis

This study follows the lexical-based approach using the dictionary AFINN-11, which contains a list of 2,477 English word forms rated for semantic orientation from minus five (negative) to plus five (positive) (Nielsen, 2011). In this paper, the original rating of the dictionary was reclassified into fewer number of categories to more clearly emphasise the semantic orientation.

The resulting classification has four categories: very negative (Vneg, -5 and -4), negative (Neg, -3, -2 or -1), positive (Pos, 1, 2 or 3) and very Positive (Vpos, 4 or 5). The final sentiment score was calculated adding the ratings of each word included in the dictionary as follows:

$$Sentiment = (-w_2) \cdot Vneg + (-w_1) \cdot Neg + w_1 \cdot Pos + w_2 \cdot Vpos \quad (1)$$

being w_1 and w_2 two weight factors that balance the relative importance of very positive or negative terms with respect to the positive or negative terms. Obviously, w_2 must be greater than w_1 to emphasise the relative weight of very positive or negative terms. Both of them should have a clear impact on the final sentiment score, as people in general avoid being too extreme in their opinions.

4. Results

A total of 200 reviews posted about Barcelona were collected from Ciao website (http://travel.ciao.co.uk/Barcelona_5296443_4) using the webscraper developed. The number 200 is actually the whole population of available reviews at the moment of data collection (June 2014).

Figure 1 shows the distribution of opinions by travel subcategory. This distribution reveals those tangible aspects of Barcelona more reviewed by visitors. Hotels is the subcategory that have received more attention followed by attractions and restaurants. At the other end, there is Pubs, bars and nightlife. The resulting distribution can be explained by the activity and variety of the nightlife in the city of Barcelona, with a wide offer that make difficult for visitors to become engaged in discussions about a specific place.

The application of the sentiment analysis approach provided a total number of 6,660 terms belonging to the four categories considered (VNeg, Neg, Pos, Vpos). Table II and Figure 2 summarise the distribution of the sentiment reviews by travel subcategory.

It can be underlined that the users avoid using very positive or very negative terms in their opinions. Obtained results show a positive bias towards Barcelona except for the subcategory attractions where nearly 30 per cent of the reviews reveal negative opinions. Destination-marketing planners must not forget any negative opinion from any category but must also pay attention especially to the attraction subcategory to detect the deficiencies and the weakness in that subcategory. In general, visitors are reluctant to write very extreme opinions in any subcategory.

The sentiment scores for the 200 collected reviews were computed considering the following values for the weight factors: $w_1 = 2$ and $w_2 = 5$.

The histogram of sentiment scores is shown in Figure 3 with its density curve superimposed. The resulting distribution is right skewed, which means there is a positive orientation towards Barcelona as a destination. The sharp shape of the histogram is explained because most of reviewers' opinions are distributed over a narrow range of scores.

Figure 1.
Opinion distribution
by travel
subcategories

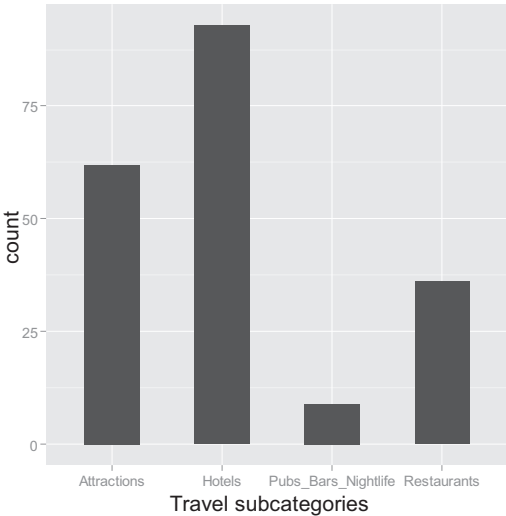
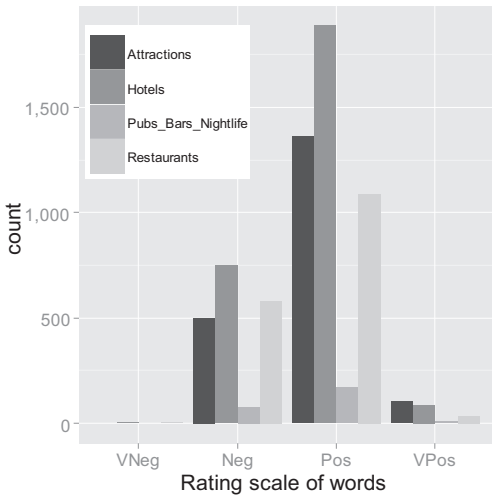


Table II.
Distribution of
sentiment reviews by
travel subcategories

	VNeg	Neg	Pos	VPoS
Hotels	4	749	1,887	89
Attractions	2	500	1,360	104
Restaurant	4	582	1,086	37
Pubs & clubs	0	77	171	8

Figure 2.
Distribution of
sentiment reviews by
travel subcategories



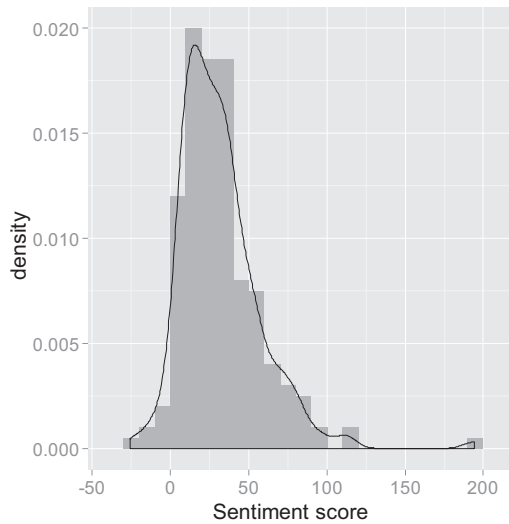


Figure 3.
Sentiment Scores
histogram with fitted
density curve

An ordered logit model has been applied to test the influence of the expertness and the author's subjective opinion of the review's perceived helpfulness. The expertness of a reviewer has been measured by two proxies: author contribution based on the number of previous reviews posted on the web and the permanence in the Ciao community measured by the number of days the reviewer has been involved in sharing and exchanging information. The reviews' length in words measures the review depth in terms of the amount of information provided. Finally, the sentiment scores provide the author's opinion orientation.

The dependent variable is the perceived helpfulness Y_i , which shows the individual's opinion about how useful the online review is for making his/her own decisions. The variable is defined as $Y_i = j$ where $j = 0, 1, 2$ corresponds to helpful, very helpful and exceptional opinions. No other alternatives were observed in the 200 posts given to Barcelona. As the multiple categories of the dependent variable are ordered, an ordered logit model was applied (Greene, 2008). In formal terms, the personal evaluation can be defined as a latent variable Y_i^* depending on a set of predictor variables:

$$Y_i^* = \beta' x_i + \varepsilon_i$$

where ε_i is the random term with normal distribution. The choice of the individual among the three alternatives, helpful, very helpful and exceptional, depends on the value Y_i^* in relation with the threshold μ_j , $j = 0, 1, 2$, that is:

$$Y_i = \begin{cases} 0 & Y_i^* \leq \mu_1 \\ 1 & \mu_1 < Y_i^* \leq \mu_2 \\ 2 & Y_i^* > \mu_2 \end{cases}$$

where the thresholds are really just coefficients of the model and verify $0 < \mu_1 < \mu_2$:

$$P(Y_i = 0) = P(Y_i^* \leq \mu_1) = P(\varepsilon_i \leq \mu_1 - \beta'x_i) = F(\mu_1 - \beta'x_i)$$

$$\begin{aligned} P(Y_i = 1) &= P(\mu_1 < Y_i^* \leq \mu_2) = P(\mu_1 - \beta'x_i < \varepsilon_i \leq \mu_2 - \beta'x_i) \\ &= F(\mu_2 - \beta'x_i) - F(\mu_1 - \beta'x_i) \end{aligned}$$

$$P(Y_i = 2) = P(Y_i^* > \mu_2) = P(\varepsilon_i > \mu_2 - \beta'x_i) = 1 - F(\mu_2 - \beta'x_i)$$

The ordered logit is then given by the following expression:

$$F(\mu_j - \beta'x_i) = \Lambda(\mu_j - \beta'x_i) = \frac{e^{(\mu_j - \beta'x_i)}}{1 + e^{(\mu_j - \beta'x_i)}}$$

The model is estimated by Maximum likelihood and the thresholds are estimated simultaneously with the estimation of the vector parameters β (Greene, 2008) (Table III).

As stated by *H1*, the perceived helpfulness increases (from helpful to exceptional) with the expertise of the reviewer, both measured in terms of the number of previous reviews posted and of the membership length at Ciao. *H2* is also confirmed since the review length appears to be more helpful to reviewers to describe the trip information in greater detail. However, no influence of sentiment score on perceived helpfulness can be observed, as posited by *H3*. The hypotheses to be tested are then fully confirmed: the level of expertise and the review depth influence the perceived helpfulness of the reviews posted, reducing the perceived risk while considering the review to make a purchase decision. The ratings given to the reviews posted appear to be objective and therefore not influenced by agreement or disagreement with the author's opinion.

The threshold parameters are significantly different from each other, revealing that the categories helpful, very helpful and exceptional should not be combined into one (Hamilton, 2006).

The ordered logit model has also been estimated without the sentiment score (Table IV) to obtain the marginal effects evaluated on the predictor means and the estimated probability to rate the comments as helpful, very helpful and exceptional (Table V and Table VI).

The results obtained show that an increase of 100 words in the online review is associated with it being 8.536 per cent more likely to rate the comment as "exceptional", and with it being 7.197 and 1.33 per cent less likely to rate the comments as very helpful and helpful, respectively. A higher expertness given by 100 days more of permanence as

Table III.
Ordered logit
regression for
perceived usefulness

	Coeff	Standard error	p-value	[95% Conf. Interval]	
Text size	0.06779	0.0009922	0.000	0.004835	0.00872
Membership	0.00014	0.0000663	0.027	0.000016	0.00027
Previous reviews	0.00119	0.0005802	0.039	0.000060	0.00233
Sentiment score	0.01067	0.0118276	0.390	-0.033493	0.13014
/cut1	21.95355			1.100326	2.80678
/cut2	7.43104			5.570432	9.29164

Notes: LR Chi²(3) = 210.48; Prob>Chi² = 0.000; Pseudo R² = 0.5044

a Ciao member and by 100 more reviews posted led to an increase of 0.195 and 1.693 per cent, respectively, in the probability of rating the comment as exceptional with respect to the other two ratings. The comment size in words appears to have the greatest marginal effect on the rating probability, followed by expertness measured by previous reviews. The membership in days in the Ciao community appears to have the lowest marginal effect on the rating probability.

5. Discussion and conclusions

This paper advances the understanding of how online reviews operate in the creation of a destination image in the pre-visit stage from the actual experience after the visit. eWOM reveals not only the actual image after the experience of visiting a destination but also its helpfulness for potential tourists, which helps to conform their pre-visit destination image. The growing revolution of web 2.0 is encouraging DMOs to analyse in detail the content presented by reviewers in virtual platforms (Law *et al.*, 2014). This idea is also supported by Dwivedi (2009), which recognises how web 2.0 is causing a paradigm shift in the image formation of a tourist destination.

Social media have become a valuable resource for tourists' experiences, where they can explicitly show their qualitative experience as well as their satisfaction/dissatisfaction with tangible attributes concerning a destination. Thus, the reviews posted appear to be of high interest to those organisations responsible for tourist marketing. However, DMOs need to invest time and effort revising the reviews to thoroughly understand the destination attributes that have been best and worst rated. In this regard, this paper proposes a method for calculating the sentiment score of tourist

	Coeff	Standard error	<i>p</i> -value	[95% Conf. Interval]	
Text size	0.063871	0.008535	0.000	0.004714	0.00806
Membership	0.000145	0.000658	0.027	0.000168	0.00027
Previous reviews	0.001266	0.000567	0.026	0.000155	0.00237
/cut1	2.021637			1.181656	2.86161
/cut2	7.510097			5.656482	9.36371

Notes: LR $\chi^2(3) = 209.73$; Prob> $\chi^2 = 0.000$; Pseudo $R^2 = 0.5027$

Table IV.
Ordered logit
regression for
perceived usefulness
without sentiment
score

	Margin	Standard error	<i>p</i> > <i>z</i>	
P(Y = helpful)	0.214168	0.1001	2.14	0.000
P(Y = very helpful)	0.819696	0.0476	17.23	0.000
P(Y = exceptional)	0.158887	0.0428	3.71	0.000

Table V.
Estimated overall
probabilities in each
perceived usefulness
category

	Exceptional	Very helpful	Helpful	Mean values
Text size	0.0008536***	−0.0007197***	−0.0001339***	773.1 (words)
Membership	0.0000195**	−0.0000164**	−3.05e ^{−06}	3,574.85 (days)
Previous reviews	0.0001693**	−0.0001428**	−0.0000266	303.76 (reviews)

Table VI.
Marginal effect of the
predictors on the
perceived usefulness
categories

destinations based on the content analysis of online shared opinions. Sentiment scores shed light on the subjective opinion of visitors' experiences of the attributes of a destination, allowing DMOs to have a clear picture of travellers' opinions without spending so much time analysing the online content, especially in the initial planning stages. Thus, sentiment analysis is an emerging field for the business world, and a powerful tool for DMOs to design marketing strategies to increase visits. In the case of Barcelona, visitors are mainly interested on hotels and attractions, and their opinions tend to be slightly positive, avoiding the use of very positive or very negative words. The analysis also shows a positive image of the city after the visit experience, since most of the travellers express a positive orientation towards Barcelona as a tourist destination. It is also important for DMOs to know whether post-travel eWOM has a great influence on potential visitors' segments. Virtual platforms, such as ciao.com, encourage eWOM readers to rate the degree of helpfulness of a review posted. Due to the experiential nature of tourism and the growing possibility for potential tourists to seek online information about actual experience in a destination, eWOM has become a relevant tool as a pre-visit image source. The paper also advances in the literature by analysing to what extent online information helps the pre-visit image formation. Bearing this in mind, the paper explores the factors driving a review to be assessed as helpful. The results obtained show that the reviewer's subjectivity measured by the sentiment score does not influence the degree of helpfulness of a review. This result suggests that online readers are objective when rating the online information posted in the virtual platform. The perceived helpfulness depends on the credibility of the information, which has been stated as an antecedent of consumers' online purchase intention (Wen, 2009). The perceived helpfulness of a review is then explained by the amount of information provided, which is measured by the number of words, and the expertise of the reviewer, which in turn is calculated by their involvement in the platform (membership and previous reviews posted on the web). Thus, potential tourists who rely on electronic UGC give more importance to the details of the description of a destination and the reviewer credibility than to the semantic orientation of the review.

5.1 Theoretical implications

This study contributes to the theoretical literature on tourist destination image from two perspectives. The first perspective consists of building the post-visit destination image based on the reviewers' posted experiences. By applying sentiment analysis techniques, it is possible to obtain the positive or negative orientation of shared reviews. For this purpose and using a dictionary, the words of the review body are classified as very negative, negative, positive or very positive, and a sentiment score is then calculated to obtain the sentiment orientation of each review. However, it is widely accepted that the credibility of information sources influences the pre-visit destination image. In this line, the second perspective of the paper consists of identifying which features of eWOM contribute to the credibility of shared opinions measured by the perceived usefulness. Previous studies have explored the influence of review balance, the reviewers' expertise and the length of eWOM reviews. However, they have not included the sentiment orientation or the marginal contribution of each factor over the perceived usefulness.

5.2 Practical implications

The post-visit brand image and the pre-visit image of a destination through eWOM is the future of marketing destination planning. More and more consumers use websites when planning their trips to a destination due to the benefits received from virtual communities. Thus, DMOs are encouraged to acquire a high qualification in understanding the information posted in the media environment and the consequences derived from it. Positive and negative eWOM offer potential consumers a clear picture on the tourist destination, which accordingly can be strategically modified by DMOs to meet the needs and expectations of a destination choice. The perceived helpfulness of reviews analysed in this paper can also help practitioners and scholars to understand those factors that make reviews more trustable. This is also a major concern for community managers and eWOM platforms in general. The anonymity of internet facilitates the introduction of malicious opinions, trying to downgrade competitors. That is why it is so important for these communities to score the credibility of reviews and avoid any kind of manipulation. Findings reveal that perceived helpfulness is mainly influenced by the expertise of the reviewer and the length of reviews. Previous studies show that experienced users are only a small fraction of the eWOM community (Arenas-Marquez *et al.*, 2014). Therefore, the experience of users measured as the number of previously posted reviews as well as the review length can be used to filter the high number of shared opinions to obtain a more reduced set of opinions to work with. For instance, DMOs can focus on this reduced set when extracting conclusions about customers' needs and preferences. Even the eWOM websites can use the experience of reviewers to display first those opinions which potentially will have more credibility.

5.3 Limitations of the study

The study presents some limitations, which provide opportunities for further research to advance in knowledge. The paper has limited the analysis to the reviews posted on a single virtual community, ciao.com, for a Spanish tourist destination, the city of Barcelona. Future research might include Spanish top destination cities to obtain information about Spain's brand image as powerful tool to attract visitors. Other websites, such as citysearch.com, may be used to explore reviews as a main source of the pre-visit formation process and the actual post-visit destination image.

The study offers a score sentiment analysis to inform about the positive or negative bias in the assessment of the destination image after the travel experience. This measure is highly important for DMOs and potential tourists seeking information. However, sentiment scores need to be considered with caution since they have to be complemented with the detection of those destination attributes (tangible and intangible) which require improvements to offer a quality destination brand. In addition, qualitative analysis might be used to analyse the texts of reviews.

The paper also analyses the helpfulness of the online comments as a proxy of the pre-visit destination image by exploring those factors which lead to a high-perceived helpfulness. Nevertheless, it is also important for any future research to study how a review's perceived helpfulness influences the destination choice and the final purchasing decisions.

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