


Exploring hidden topics on hotel Facebook fan pages before and during the COVID-19 crisis

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Abstract

Purpose – This study analyzes the way that firm-generated content (FGC) was adapted in the accommodation sector through hotel chains' Facebook posts at a time of crisis. Specifically, this research aims to: (1) explore hidden topics in hotel chains' FGC; (2) classify topics according to their promotional or non-promotional content; and (3) compare topics during the first months of the COVID-19 crisis and the same months of 2019.

Theoretical framework – The method/theoretical approach used in this research is social network analysis.

Design/methodology/approach – We used content analysis to examine 1,317 Facebook posts from the five hotel chains with the greatest presence in Spain. NodeXL software was used to create a semantic network to reveal the relationships between the ideas embedded in the text collection.

Findings – 14 latent topics were found in each period, including promotional and non-promotional content. Non-promotional topics increased from one third in 2019 to more than half in 2020, and the most relevant topic in 2020 was "Competitions".

Practical & social implications of the research – The findings of our study suggest that during the pandemic, unlike other crises, hotel chains used Facebook to accompany users, entertain them, and maintain the emotional connection with the brand, responding to societal demands.

Originality/value – This study is novel not only because of its focus on FGC in the tourist accommodation sector, but also because it uses semantic network analysis to study the way in which firms make use of social media in crisis situations.

Keywords: Content analysis, semantic network, firm-generated content, accommodation, tourism crisis.

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I Introduction

New technologies have given companies greater immediacy and more direct interactions with consumers whenever these digital tools are used in powerful marketing campaigns (Hays et al., 2013; Heredia, et al., 2022; Japutra et al., 2022b; Liébana-Cabanillas et al., 2020; Mahardika et al., 2019). Specifically, social media have been integrated into both social and economic life, and it has been demonstrated that the content of platforms such as Facebook and Twitter can influence user decision-making (Batra & Keller, 2016; Heng Wei et al., 2023; Law et al., 2020; Moro & Rita, 2018; Xiang & Gretzel, 2010; Zeng & Gerritsen, 2014). As a result, other organizations and brands have adapted the techniques and the information presented on these platforms both for their marketing campaigns (Moro et al., 2016) and for the effective communication of their company values (Heng Wei et al., 2023). This is relevant when considering the link between social networks and mobile applications as a new channel for interacting with customers, which impacts customer engagement (Japutra et al., 2021, 2022a, 2022b; Molinillo et al., 2020; Utami et al., 2022).

Regarding brand-specific content in social networks, most research has focused on user generated content (UGC), and to a lesser extent, the incorporation of business strategies through firm-generated content (FGC) (Kim et al., 2023; Kumar et al., 2016; Leung et al., 2013; Moro & Rita, 2018; Santiago et al., 2022). In this sense, FGC can complement UGC (Aljarah et al., 2022; Yu, 2022) and helps companies create, maintain, and reinforce their relationships with target consumers (Poulis et al., 2019). Firms can publish information on their products, launch promotions, and provide responses to their customers, reaching potential consumers more easily and through more selective targeting (Wan & Ren, 2017). More specifically, FGC through social media has been analyzed in studies that differentiate between two types of content: (a) promotional and (b) non-promotional, which convey emotional values, such as messages that serve to entertain and inform about social actions in which the firm is engaged (Cvijikj & Michahelles, 2013; De Vries et al., 2012; Kumar et al., 2016; Luarn et al., 2015; Montaguti et al., 2023; Shahbaznezhad et al., 2021; Shen & Bissell, 2013; Tafesse, 2015).

Different content analysis techniques that enable researchers to identify relevant properties of large amounts of textual information have been used to categorize messages (Jabreel et al., 2017; Roberts, 2000).

Such techniques include semantic network analysis, which, unlike traditional analysis, does not require preconceived categories (Doerfel, 1998) and has been widely accepted as a helpful method for exploring word associations in texts (Jang et al., 2022; Smith & Smith, 2022; Yoon & Chung, 2018b). Semantic network analysis has been successfully applied to social networks in various fields, including medicine (Kang et al., 2017; Tang et al., 2018), political science (Park et al., 2020), social movements (Eddington, 2018; Xiong et al., 2019), public administration (Liu et al., 2018; Sevin, 2014; Wang & Xu, 2022), marketing (Hong et al., 2016; Youn & Jung, 2021), and hospitality or tourism (Feizollah et al., 2021; Jang et al., 2022; Park et al., 2018; Yoon & Chung, 2018a). However, the use of semantic networks to analyze FGC in the tourism sector represents a gap in the existing literature, despite its utility for the content analysis of hundreds of hotel chain publications and social network messages, and its potential contribution to guiding their marketing strategies.

Moreover, we cannot forget the impact that COVID-19 has had on the tourism sector since 2020 (António & Rita, 2021; Gössling et al., 2020; World Tourism Organization, 2021; Zenker & Kock, 2020) and on the creation of content strategies. The hotel industry, as a critical player in the tourism industry, is one of the most negatively impacted economic sectors (Anguera-Torrell et al., 2021). The fact is that different types of crises have different consequences and oblige hoteliers to adopt new measures to confront the challenges that these crises can provoke, thus increasing the confidence of travelers and contributing to the recovery of firms (Jiang & Wen, 2020). The relationship between the advertising conveyed through tourism marketing and the values of the target audience becomes crucial in times of crisis. It is necessary to adapt the messages disseminated to address the concerns of customers or the general public in order to prevent them from ceasing to consume the brand. In other words, the application of audience-focused marketing strategies is essential (Gretzel et al., 2020; Jiang & Wen, 2020; Ketter & Avraham, 2021). In this sense, the tourism offer can promote and attract customers to online channels and virtual experiences, forming brand-related emotional connections, trust, and values (Sigala, 2020). As evidence of these effects, in a survey conducted by the communications firm Edelman in 2020, more than 80% of participants believed that in order to maintain trust in the brand during the pandemic, firms should connect with customers, helping them to stay emotionally close and promoting a sense of community (Edelman, 2020).

Studies on the effects of COVID-19 on brand-specific content on the social networks of tourism organizations have basically focused on UGC, analyzing the opinions, feelings, and reactions of potential users and customers (Carvache-Franco et al., 2023a, 2023b; Flores-Ruiz et al., 2021; Hang et al., 2020; Nilashi et al., 2021; Rather, 2021; Rita et al., 2022; Yu et al., 2020). The few studies in which COVID-19 has been analyzed in FGC have focused on the content published by destination marketing organizations (DMOs) (Huertas et al., 2020; Ketter & Avraham, 2021; Kumar et al., 2022; Pachucki et al., 2022). There are even fewer studies that have examined the types of content published by tourism firms through social media (Camarinha et al., 2021; Kwok et al., 2022; Mušanović et al., 2023).

This analysis is particularly important given that prior to the COVID-19 pandemic, research showed that FGC positively affected various dimensions of the brand and consumer purchase intentions (Poulis et al., 2019; Wan & Ren, 2017). However, subsequent studies have found changes in the effect of FGC on the purchase intentions of consumers who did not shop online before the pandemic (Santiago et al., 2022).

Once again, there is a research gap regarding the incorporation of COVID-19 into the FGC of tourism companies, which may differ from the strategies used by DMOs, which are subject to destination policies. This research aims to extend the studies on the adaptation of firms in prolonged tourism crises, as well as on audience-focused marketing strategies. Additionally, although several studies have been published analyzing the adaptive capacity and resilience of the hospitality sector due to COVID-19 (Duarte Alonso et al., 2020; Jiang & Wen, 2020; Sharma et al., 2022; Wong et al., 2023), the use of social networks must be developed as a tool to support its resilience against future crises.

Therefore, the aim of this paper is to contribute to the scarce research on the integration of social networks and their adaptation in the crisis management strategies of tourism companies. To this end, the following research objectives and questions are proposed:

1. Explore hidden topics in the FGC of hotel chains.

RQ1. What are the topics of the Facebook messages of hotel chains?

2. Classify topics according to their promotional or non-promotional content.

RQ2. What were the topics of promotional and non-promotional content generated?

3. Compare topics during the first six months of the COVID-19 crisis, using the same semester of 2019 as a reference.

RQ3a. Did the topics of the messages that hotel chains published on Facebook in 2020 change in relation to 2019?

RQ3b. Was there an increase in non-promotional messages in the first months after the declaration of a pandemic due to COVID-19?

RQ3c. Were new topics created that were directly related to COVID-19?

2 Literature review

2.1 Crises and disasters: focus on COVID-19

A distinction can be made between crises and disasters based on the role that organizations and people may or may not play in their origins. Thus, a crisis is considered to be the result of organizational failure, while a disaster is an external event over which organizations have no immediate or direct control (Faulkner, 2001; Ritchie, 2004). However, the conceptualization of these events is fluid, because man-made disasters tend to be more like crises and some natural disasters are man-made (Zenker & Kock, 2020). Regardless of this distinction, if we are to learn from experience, then the analysis of crisis and disaster management is essential to confront similar situations that might occur in the future (Japutra & Situmorang, 2021).

The coronavirus pandemic has led to a crisis that is not only different, but will also leave complex repercussions and challenges due to its socio-cultural, economic, and political impacts (Japutra & Situmorang, 2021; Sigala, 2020; Zenker & Kock, 2020). Most of the socio-cultural effects were caused by changes in living and working conditions, which led to a greater reliance

on new information and communication technologies (Messabia et al., 2022), but also improved innovation and collaboration capabilities (Al-Omouh et al., 2022; Rafique et al., 2022). The economic effects were widespread, and globalization only exacerbated them through a supply-side crisis that was immediately fueled by unmet demand, consumption, and investment (Guaita Martínez et al., 2022). Among the political consequences, their impact on the scope of the Sustainable Development Goals (SDGs) disrupted attempts in some countries to achieve the 2030 Agenda (Chopra et al., 2022). However, in the recovery and growth phase, a return to the path of sustainability through the green economy, renewable energy, and energy transition has been particularly important (Chopra et al., 2022; Fernández-Villarán & Uresandi, 2022; Guaita Martínez et al., 2022), but it requires government support (Bhrammanachote & Sawangdee, 2021).

The COVID-19 crisis has, to a certain extent, affected the tourism sector due to mobility constraints. Tourism has had to manage crises in the form of terrorism (Avraham, 2015; Barbe & Pennington-Gray, 2018), natural and man-made disasters (Ketter, 2016; Liu et al., 2018; Pennington-Gray et al., 2011), and epidemics (Novelli et al., 2018; Page et al., 2006; Zeng et al., 2005). The different consequences of each different type of crisis have affected the tourism sector, driving it to take appropriate measures to cope with the various challenges brought about by the crisis (Aguado-Correa et al., 2022; Chen et al., 2021; Jiang & Wen, 2020; Ritchie & Jiang, 2019; Sigala, 2011; Zenker & Kock, 2020). However, in the current context of economic globalization, the digital economy plays a relevant role in recovery (Guaita Martínez et al., 2022). In this context, communication through social networks can be very useful for tourism companies to communicate good practices in response to the crisis and to understand the new demands, new relationships, and new methods that have emerged after the epidemic (Chen et al., 2021).

2.2 FGC at a time of crisis in tourism

Tourism firms must prepare to integrate social media into their crisis management strategies, evaluating the quantity and type of informative content that they communicate through social media (Chen et al., 2021; Pennington-Gray et al., 2011; Sigala, 2011). Despite the relevance of the topic, there is a scarcity of research related to the adaptation of strategies for using social media at times of crisis.

Pennington-Gray et al. (2011) studied the crisis management strategies used in the tourism crisis related to an oil spill, and they set out the need to include social networks in the tourism crisis management planning model, because in this case they were crucial in restoring the image of the tourist destination.

Ketter (2016) studied the revival of the tourist destination's image on Facebook after an earthquake, reflecting the importance of social networks in supporting a DMO in times of natural disasters. In particular, he focused on both the technical information of the messages and on reports and links to news articles, seeking to convey an independent message and communicate directly with the public.

Barbe and Pennington-Gray (2018) analyzed Twitter messages sent from hotels in Florida during various crises that were widely reported worldwide, and among the topics of the messages, those related to the feeling of unity, love, and victim support were the most frequently repeated.

Huertas et al. (2020) studied the main content of tweets from DMOs during the first COVID-19 crisis and highlighted the high volume of messages about protecting the image of the destination as a tourist attraction and, to a lesser extent, messages about managing the COVID-19 crisis and protecting stakeholders.

Ketter and Avraham (2021) analyzed the content of messages on the YouTube channels of different DMOs during the coronavirus pandemic and observed differences between FGC during and after lockdown. They concluded that during lockdown, destinations adopted marketing strategies based on hope/inspiration, the brotherhood of man, and nostalgia to maintain emotional connections with key audiences. In the post-confinement stage, online marketing managers used welcoming strategies, safety, and restorative experiences to adapt to new travel restrictions and changing consumer attitudes.

The study of Camarinha et al. (2021) focused on information published on the websites of some Portuguese tourism firms during the COVID-19 crisis, although it also included some content from social networks. Their conclusion was that social networks provided only some information on the existence of a returns policy and showed social actions directed at health professionals and volunteers.

The study by Kwok et al. (2022) analyzed the content of COVID-19-related messages from hospitality companies on Facebook and Twitter, identifying five types: prevention, reminding, ingratiation, victimage, and updates.

This study concluded that only 20% of all messages posted between January and June 2020 were related to the pandemic, primarily focusing on ingratiation (praising stakeholders such as staff, customers, and the management team) and updates (about adjustments to operations due to COVID-19 or expressions of hope about COVID-19). These types of messages, along with prevention and reminding, as well as photos and videos, received the most attention.

Mušanović et al. (2023) used the topic modeling technique to study how 5-star Italian hotels communicated on Facebook before and during the COVID-19 pandemic. The findings of this study reflected different topics in 2019, 2020, and 2021, highlighting messages related to trust, safety, and cordiality during the pandemic.

2.3 Content analysis using semantic networks in the tourism sector

Due to the large amount of information on social networks, their study through content analysis is of particular interest as a source of big data, which has been widely used in tourism (Li et al., 2018). Content analysis refers to a family of procedures for systematic, replicable text analysis. Among the quantitative content analysis techniques, we can distinguish semantic network analysis, which consists of graphical representations of knowledge based on meaningful relationships within written texts, structured as a network of words that are cognitively related to each other (Kang et al., 2017). Within the semantic network, the nodes are words that represent concepts found in the text, and the connections between the nodes represent the relationships between the interconnected concepts (Kang et al., 2017).

Semantic networks have been used in the field of FGC, for example, to examine whether there is a significant difference between the activity levels and the semantic networks of the Facebook pages of highly reputable and less reputable companies in the same industry (Hong et al., 2016), and to analyze the official tweets of 67 government and emergency management organizations after Hurricane Harvey (Liu et al., 2018). However, semantic network analysis of social networks in the field of hospitality and tourism has only recently been introduced. Studies are scarce and focused on UGC. For example, Yoon and Chung (2018a) studied changes in tourist destination promotion strategies through semantic network analysis of user messages published

on the Facebook profiles of each DMO. In the study of Park et al. (2018), they used semantic networks to study which of the words employed by users on the Facebook profile of Walt Disney World were the most influential words before and during Hurricane Irma. Finally, semantic networks were applied in the work of Feizollah et al. (2021) to study tweets related to “halal tourism.”

2.4 Promotional and non-promotional content in messages published on tourism social networks

Different classifications of messages based on their content can be found in the literature. Two types of messages within the FGC published on official pages can be distinguished: 1) promotional, informative, or product-related posts; and 2) non-promotional posts (Kumar et al., 2016). The second group includes brand image-related and emotional messages: emotional posts (Cervellon & Galipienzo, 2015), posts relating to entertainment and social aspects (Ge & Gretzel, 2017, 2018), information not directly related to the hotel, brand, and involvement (Leung et al., 2017), and emotional/hedonic posts (Molina et al., 2020).

Researchers have come to different conclusions about the use and effectiveness of promotional and non-promotional posts within FGC strategies in the tourism sector. This evidence may be the result of the spread of social networks, both due to the expansion of their use and changes in e-marketing strategies. In this sense, a high propensity to use messages to promote hotels and destinations has been noted in the oldest studies (Cervellon & Galipienzo, 2015; Huertas & Marine-Roig, 2016; Minazzi & Lagrosen, 2013; Yoo & Lee, 2015). According to Cervellon and Galipienzo (2015), this was an effective strategy because when potential customers browsed the hotels' Facebook pages, their main motivation was to find information to make an appropriate choice. This can be contrasted with the way in which users reacted to the content of the messages. Specifically, Huertas and Marine-Roig (2016) showed evidence that the communication of the distinctive emotional values of tourist destinations and the communication of specific and unique values generated more reactions on Facebook than otherwise.

Over time, the studies showed less and less differences between the number of messages directly related to the destination and its tourism products/services and the proportion of non-promotional messages published by firms (Ge & Gretzel, 2017; Leung et al., 2017).

The greater effectiveness of non-promotional or emotional messages, as opposed to promotional messages and messages about the attributes of a destination, has also been noted (Ge & Gretzel, 2017; Hernández-Ortega et al., 2020; Molina et al., 2020; Pino et al., 2019). Similarly, some works, such as that of Leung et al. (2017), study messaging in even greater depth, highlighting the effectiveness of some messages, regardless of their informational or emotional nature. These authors concluded that product-, brand-, and involvement-related messages were more effective than informative, reward-oriented, and promotional messages.

3 Methodology

Our study focuses on Spain, the country with the second highest number of foreign visitors in the world, where the tourism sector accounted for 12.4% of GDP

and 12.9% of employment in 2019 (Spanish Statistical Office, 2020). We applied semantic network analysis, using NodeXL software (Smith et al., 2010), to examine the messages published on Facebook by the five hotel chains with the greatest presence in Spain (Table 1). In particular, Facebook occupies third position in Spain in terms of number of global users (79.2%), behind WhatsApp and YouTube (Kemp, 2021). Although Spanish hotels pursue network diversification, covering a large number of potentially different customer profiles (Mellinas et al., 2014; Moral Cuadra et al., 2014; Rabadán-Martín et al., 2020), Facebook has an important presence in these establishments (Rabadán-Martín et al., 2020).

In particular, we carried out four stages: data collection, pre-processing, data analysis, and evaluation, as shown in Figure 1.

Table 1
Ranking of the 5 most dominant hotel chains in Spain

Hotel chain	Facebook fan page	Hotel establishments		Rooms	
		2020	2019	2020	2019
Meliá Hotels International	@MeliaHotelsinternational	137	143	33,249	34,172
Barceló Hotel Group	@barcelohotels	66	65	16,735	16,421
Eurostars Hotel Company	@hoteleseurostars	141	133	14,711	13,728
NH Hotel Group	@NH.Hotels	99	106	12,105	12,786
Riu Hotels & Resort	@Riuhoteles	28	29	11,540	11,318

Source: HOSTELTUR (2021).

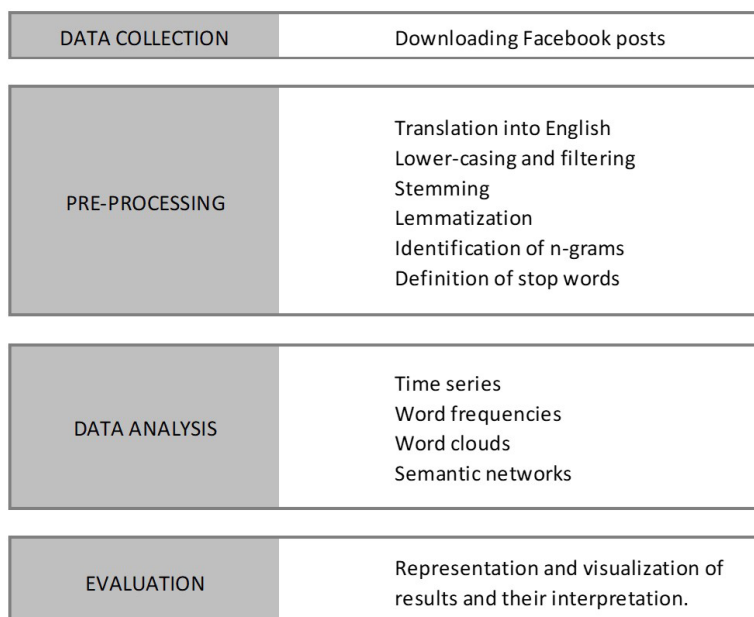


Figure 1. Data collection and analysis

3.1 Data collection

On March 11 2020, the World Health Organization officially declared a global pandemic following the outbreak of COVID-19 (World Health Organization, 2020). In Spain, a state of alert was declared on March 14 of the same year, and the population was placed under lockdown. At the beginning of May 2020, a period of adaptation began with the gradual relaxation of confinement measures and restrictions on mobility, which ended on June 21. However, the effects of this crisis on tourism were prolonged by a reluctance to travel to destinations or to stay at hotels.

Based on this situation, a temporal horizon of six months was chosen for the data collection period from the start of lockdown in Spain, in other words, from March 14, 2020 to September 14 of that same year. In this way, the content of the messages could be observed throughout lockdown and the re-opening of the establishments. With the purpose of comparing the communication strategies of 2020 with those of the previous year, the messages published by the hotel chains during the same period of 2019 were also compiled (Supplementary Material - Supplementary Data 1 – database). Other studies investigating FGC on Facebook have used samples ranging from one or two months (Cvijikj & Michahelles, 2013; Hong et al., 2016; Ketter, 2016; Park et al., 2018; Tafesse, 2015) to 12 months (Minazzi & Lagrosen, 2013). More specifically, some studies focusing on tourism crises have used longitudinal time samples shorter than six months (Camarinha et al., 2021; Ketter, 2016; Park et al., 2018). Therefore, based on the literature, a 12-month period (6 months in 2019 and 6 months in 2020) was chosen for this study.

The posted messages were manually indexed by noting down the hotel chain, the date of posting, the message format (link, photo, status, survey, text or video), and the text of the message for each post. The messages were collected in both Spanish and English, and duplicate messages in both languages were removed.

3.2 Pre-processing

Before processing the data in the messages, manual pre-processing was performed to clean the corpus as much as possible. This phase started with the translation into English of the messages published in Spanish for a wider dissemination of the study (Supplementary Material - Supplementary Data 2 – translated database).

The messages were then pre-processed, which included the usual procedures (Feizollah et al., 2021; Jabreel et al., 2017; Liu et al., 2018; Tang et al., 2018; Xiong et al., 2019): lowercasing and filtering (all URLs, numbers, usernames, hotel chains, and establishments were removed, and a preliminary list of words with their frequencies was created using the NodeXL software, ignoring a list of stop words); stemming (a new list of words was placed in singular and the verbs that were not in gerundive or participle forms were changed to infinitives); lemmatization (removing only the morphemic endings, leaving only the root word or lemma); identification of n-grams (combining word pairs that often occurred together and needed to be treated as a single concept).

3.3 Data analysis

After processing the messages, two lists of words and n-grams were generated, one for 2019 and another for 2020. With this information, a descriptive analysis of the words most used by each hotel chain in the two study periods was performed, using word clouds (the 50 most used words) to show the differences between them. In addition, the publication dates and message format were compared by year of study.

Subsequently, a list of co-occurrence terms was generated using NodeXL (Eddington, 2018; Hong et al., 2016; Park et al., 2018; Sevin, 2014; Youn & Jung, 2021), which served as the basis for the semantic network analysis and from which all the hashtags were excluded as they implied a complete concept. After obtaining this initial list of co-occurrence terms, only those word pairs whose frequency was higher than 2 cases were considered. These data were incorporated into a new file and, again using NodeXL, the semantic networks were created using the clustering algorithm of Clauset-Newman-Moore (Clauset et al., 2004; Eddington, 2018; O'Regan & Choe, 2023). The aim of the analysis was to place the words (nodes or vertices) that shared more connections (edges) with other words into a single cluster. Considering the nature of the content, the clusters could reveal similar thematic elements, thus helping to contextualize the different topics identified through the semantic network analysis.

Two semantic network structures were then generated, one for each year, without differentiating between hotel chains. The study focused on those clusters composed of at least 4 words. Each of these clusters was weighted according to the number of repeated words it contained.

Then, labels were assigned to identify the topics of each cluster. To do this, a team of three researchers discussed and assigned the labels depending on the most important words of each group and the contextualization of some word pairs from a close reading of the posts in which they were found. Finally, the topics were divided into two categories: 1) promotional messages, aimed at promoting the service through the transmission of information about the establishment/destination and economic incentives; 2) non-promotional messages, emphasizing emotional and social aspects and entertainment.

4 Results

4.1 Descriptive analysis

Initially, 1,335 messages written in Spanish and English were compiled, and after removing those that were duplicated in both languages, 1,317 messages (852 in 2019 and 465 in 2020) were analyzed. After pre-processing these

messages, two lists of words and n-grams were obtained, consisting of 2,453 terms for 2019 and 1,604 for 2020 (Supplementary Material - Supplementary Data 3 – list of words and n-grams).

An initial analysis of the data showed us that the publication of the Facebook posts by the hotel chains had undergone substantial changes, both in the quantity of messages published and in their format (Figure 2). In 2019, a certain stability in the volume of the messages was observed over several months, with an important peak in mid-June for the preparation of the summer season. In 2020, low levels of activity on the Facebook accounts were observed during the lockdown period, and the increase in July was due to the publication of information about the reopening of the installations. Nevertheless, the low demand for tourism in that year, after the lockdown period, kept activity on the Facebook accounts below the levels of 2019. In particular, the average daily rate of messages fell from 4.6 in 2019 to 2.5 in 2020, considering all the publications of the five hotel chains.

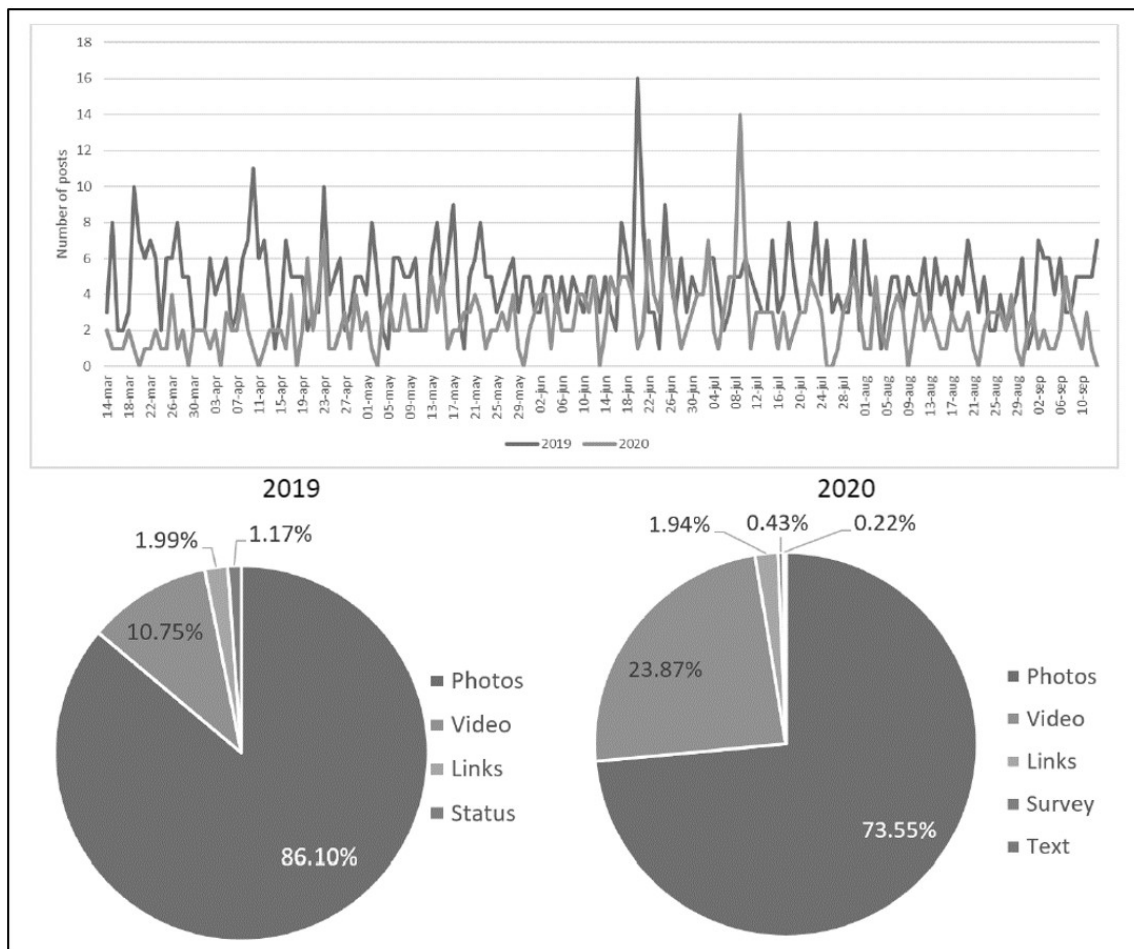


Figure 2. Evolution of the number of Facebook posts and message formats (2019-2020)

On the other hand, with regard to the changing formats of the posts, there was a clear increase in videos in 2020, from 10.75% to 23.87%, in place of photos. Likewise, the survey and text format appeared in 2020, though with very few examples.

With respect to the analysis of the words published in the posts, there were significant differences between the two years under study (Table 2). Although “stay,” “win,” and “enjoy” were among the four most frequently used words in both periods, “today,” “open” and, of course, “safe,” all climbed quite significantly in the ranking in 2020.

The individual study of each Facebook profile showed differences between the different hotel chains (Figure 3). In particular, the case of Meliá Hotels International stood out, as the most frequent words used in 2019 were oriented towards enjoying the experience, the beach and relaxation, whereas their messages in 2020 were directly focused on the recovery of reservations. Riu Hotels & Resort also showed a very different word cloud in 2019 and 2020, giving great importance in 2020 to information about the re-opening of the establishments after lockdown.

4.2 Analysis of semantic networks

The initial list of co-occurrence terms for the semantic network of the set of hotel chains generated a total of 7,880 pairs in 2019 and 4,473 in 2020 (Supplementary Material - Supplementary Data 4 – list of co-occurrence terms). Considering those pairs whose frequencies exceeded 2 cases, 356 co-occurrence pairs were found for the first year (2019) and 176 for the second year (2020).

Initially, the semantic network generated for 2019 had 36 clusters, while the one for 2020 had 28. After focusing the study on those clusters composed of at least 4 words, the semantic network for 2019 was represented by 321 edges grouped into 14 clusters, and the one for 2020 had 160 edges grouped into 14 clusters (Supplementary Material - Supplementary Data 5 – NodeXL results).

The FGC trends reflected in the semantic networks showed immense differences in both years. This can be seen in Figure 4 and Figure 5, in which the words with a higher number of occurrences are represented in larger sizes.

Table 2
List of the 20 most frequently used words in the messages (2019-2020)

2019			2020			Change in rank
Rank 2019	Word	Count	Rank 2020	Word	Count	
1	stay	155	1	win	84	↑+1
2	win	127	2	enjoy	72	↑+1
3	enjoy	119	3	day	70	↑+11
4	city	98	4	stay	68	↓-3
5	holiday	96	5	today	67	↑+81
6	summer	94	6	open	65	↑+71
7	locate	94	7	holiday	58	↓-2
8	know	88	8	time	53	↑+20
9	discover	85	9	want	53	↑+2
10	booking	79	10	city	53	↓-6
11	want	78	11	booking	47	↓-1
12	experience	78	12	visit	45	↑+24
13	come	73	13	now	45	↑+16
14	day	72	14	participate	42	↑+7
15	destination	71	15	discover	42	↓-6
16	beach	69	16	free	41	↑+3
17	relax	67	17	destination	40	↓-2
18	make	65	18	safe	37	↑+488
19	free	64	19	know	36	↓-11
20	new	59	20	contest	34	↑+7



Figure 3. Word clouds of the messages published by the hotel chains (2019-2020)

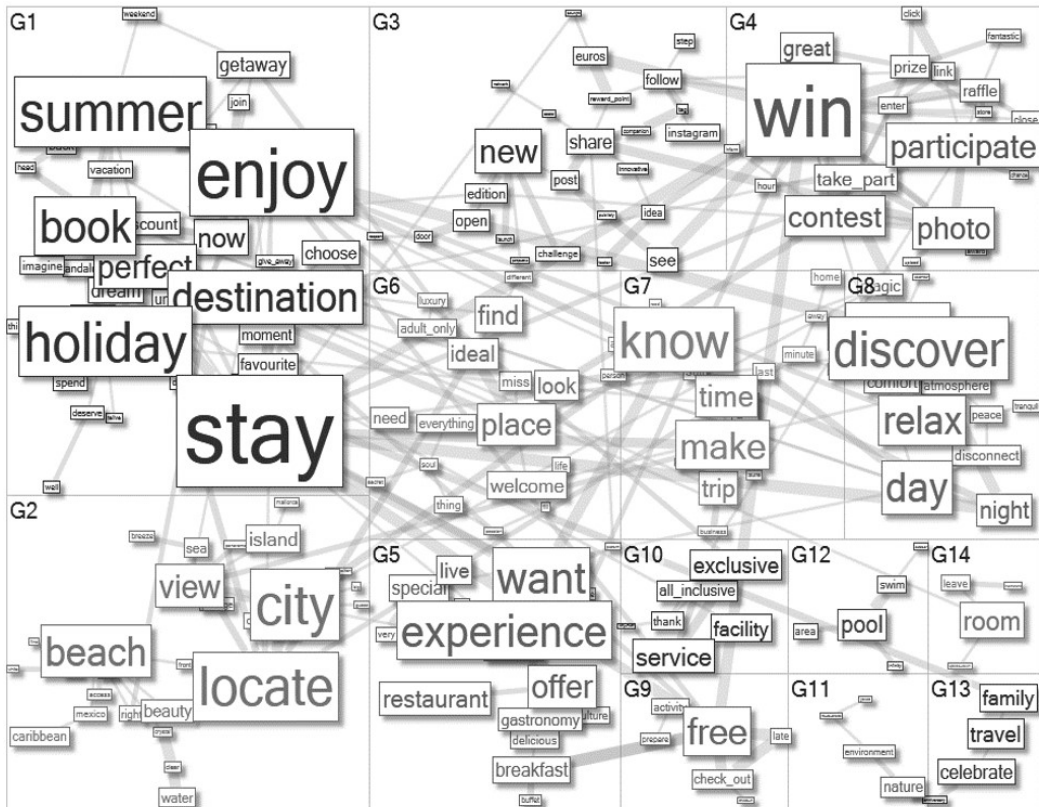


Figure 4. Semantic network 2019

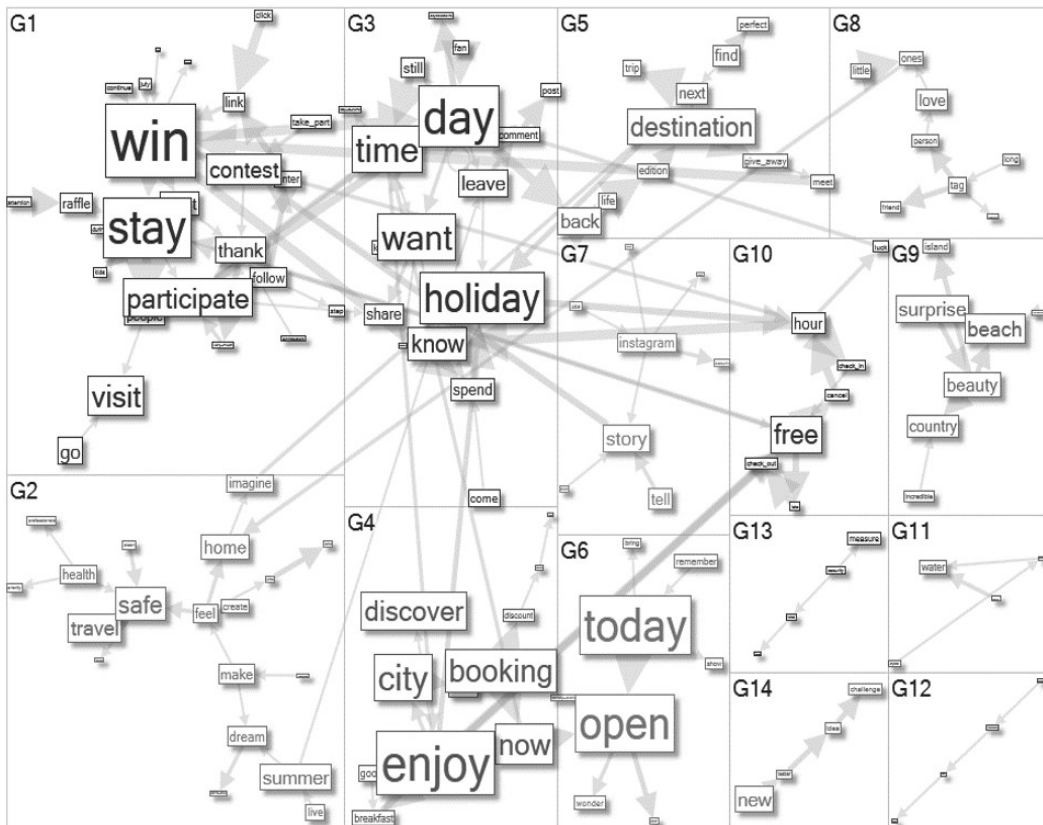


Figure 5. Semantic network 2020

With regard to the topics analysis (Tables 3 and 4), a clear change in the discourse of hotel chains on Facebook can be observed between 2019 and 2020. Although the messages related to “incentives to make reservations,” “competitions,” “invitation to share content on social networks” and “characteristics of the reservation” were maintained in both years, all other topics varied. As expected, there were groups of messages related to COVID-19 in 2020: “G2: safety,” “G6: openings,” “G12: emergency units” and “G13: security forces.” However, the weight or relative importance of these topics was low, given the small number of posts published on these topics (Table 4).

The analysis of the weights of the different topics showed that the ones that were maintained over time varied in importance (Tables 3 and 4). For example, the topic “Incentives to make reservations,” with the highest weight in 2019 (0.26), was halved in 2020 (0.13). On the other hand, an inverse behavior was observed for the topic “Competitions,” as its weight almost doubled to reach a higher value in 2020 (0.21).

If we take into account the classification of the promotional and non-promotional topics (Tables 3 and 4), we can see a lower weight of the latter in 2019 (35%).

Table 3
Summary of the topics forming the semantic network of messages in 2019

Group	Topic	Vertices	Edges	Weight	Top words	Promotional/ Non-promotional
G1	Incentives to make reservations	47	70	0.26	Stay, enjoy, holiday, summer, book, destination, perfect, now, next, start.	Promotional
G2	Characteristics of location/ destination	30	31	0.12	City, locate, beach, view, island, beauty, sea, water, Caribbean, heart.	Promotional
G3	Invitations to share content on social networks	25	26	0.07	New, share, see, open, edition, follow, post, Euros, Instagram, idea.	Non-promotional
G4	Competitions	22	42	0.11	Win, participate, photo, contest, great, take part, prize, raffle, link, enter.	Non-promotional
G5	Experience	18	18	0.09	Experience, want, offer, restaurant, live, unique, breakfast, special, gastronomy, delicious.	Promotional
G6	Ideal place	18	18	0.07	Place, find, ideal, look, welcome, need, miss, adult only, everything, thing.	Promotional
G7	Travel	16	15	0.08	Know, make, time, trip, go, still, last, home, already, minute.	Non-promotional
G8	Discover/relax	14	14	0.09	Discover, come, day, relax, night, visit, comfort, magic, disconnect, atmosphere.	Non-promotional
G9	Reservation characteristics	6	6	0.02	Free, check out, activity, late, prepare, check in,	Promotional
G10	All-inclusive	6	6	0.03	Service, exclusive, facility, all inclusive, thank, very much	Promotional
G11	Galicia*-nature	5	4	0.01	Nature, environment, park, Galicia, Ría de Arousa.	Promotional
G12	Swimming pool	5	4	0.02	Pool, swim, area, infinity, outdoor.	Promotional
G13	Family	4	3	0.02	Travel, family, celebrate, anniversary.	Promotional
G14	Room	4	3	0.01	Room, leave, indifferent, upside down.	Promotional

* Galicia is a region of Spain



Table 4
Summary of the topics forming the semantic network of messages in 2020

Group	Topic	Vertices	Edges	Weight	Top words	Promotional/ Non-promotional (Group 2019)
G1	Competitions	25	32	0.21	Win, stay, visit, participate, contest, go, thank, night, follow, raffle.	Non-promotional (G4)
G2	Safety (COVID-19)	19	18	0.11	Safe, travel, summer, home, make, dream, feel, health, imagine, live.	Promotional
G3	Desire for holidays	17	19	0.17	Day, holiday, time, want, know, leave, spend, share, still, come.	Non-promotional
G4	Incentives to make reservations	11	10	0.13	Enjoy, city, booking, now, discover, wait, good, breakfast, discount, club.	Promotional (G1)
G5	Destination/escape	10	9	0.08	Destination, back, find, next, life, trip, edition, give away, meet, perfect.	Promotional
G6	Open	8	7	0.07	Today, open, remember, wonder, bring, show, Canary Island, door.	Promotional
G7	Invitations to share content on social networks	8	7	0.04	Story, tell, Instagram, use, account, short, profile, Twitter.	Non-promotional (G3)
G8	Feelings of unity/friendship/love	8	7	0.05	Love, tag, little, ones, long, person, friend, different.	Non-promotional
G9	Beach	7	6	0.05	Beach, surprise, beauty, country, island, incredible, del Carmen.	Promotional
G10	Reservation characteristics	7	8	0.04	Free, hour, cancel, luck, check in, check out, late.	Promotional (G9)
G11	Appearance of the water	4	3	0.01	Water, crystal, warm, clear.	Promotional
G12	Emergency units (COVID-19)	4	3	0.01	UME <i>Unidad Militar de Emergencias</i> [Emergency Military Unit]	Non-promotional
G13	Security forces (COVID-19)	4	3	0.01	Measure, security, force, corps.	Non-promotional
G14	Challenges/ideas	4	3	0.02	New, challenge, idea, tester.	Non-promotional

This situation changes in 2020, when Facebook is used to a greater extent to convey feelings of unity, encourage participation and provide entertainment during lockdown, increasing non-promotional posts to 51% (Figure 6).

5 Discussion and conclusions

The tourism industry can and must use communications media in general, and social media in particular, to communicate frequently with the public about its good practices in the face of the crisis (Chen et al., 2021). In this sense, the coronavirus pandemic has implied an opportunity to adjust the FGC strategies of the hotel sector by changing the topics of the messages on social media.

With regard to the first objective, and in response to RQ1, semantic network analysis identified 14 hidden topics in both 2019 and 2020. To address RQ2, these topics were classified based on their promotional content (incentives to make reservations, characteristics of location/destination, experience, ideal place, reservation characteristics, all-inclusive, Galicia-nature, swimming pool, family, room, safety, destination/escape, open, beach, and appearance of the water) and non-promotional content (invitations to share content on social networks, competitions, travel, discover/relax, desire for vacations, feelings of unity/friendship/love, emergency units, security forces, and challenges/ideas).

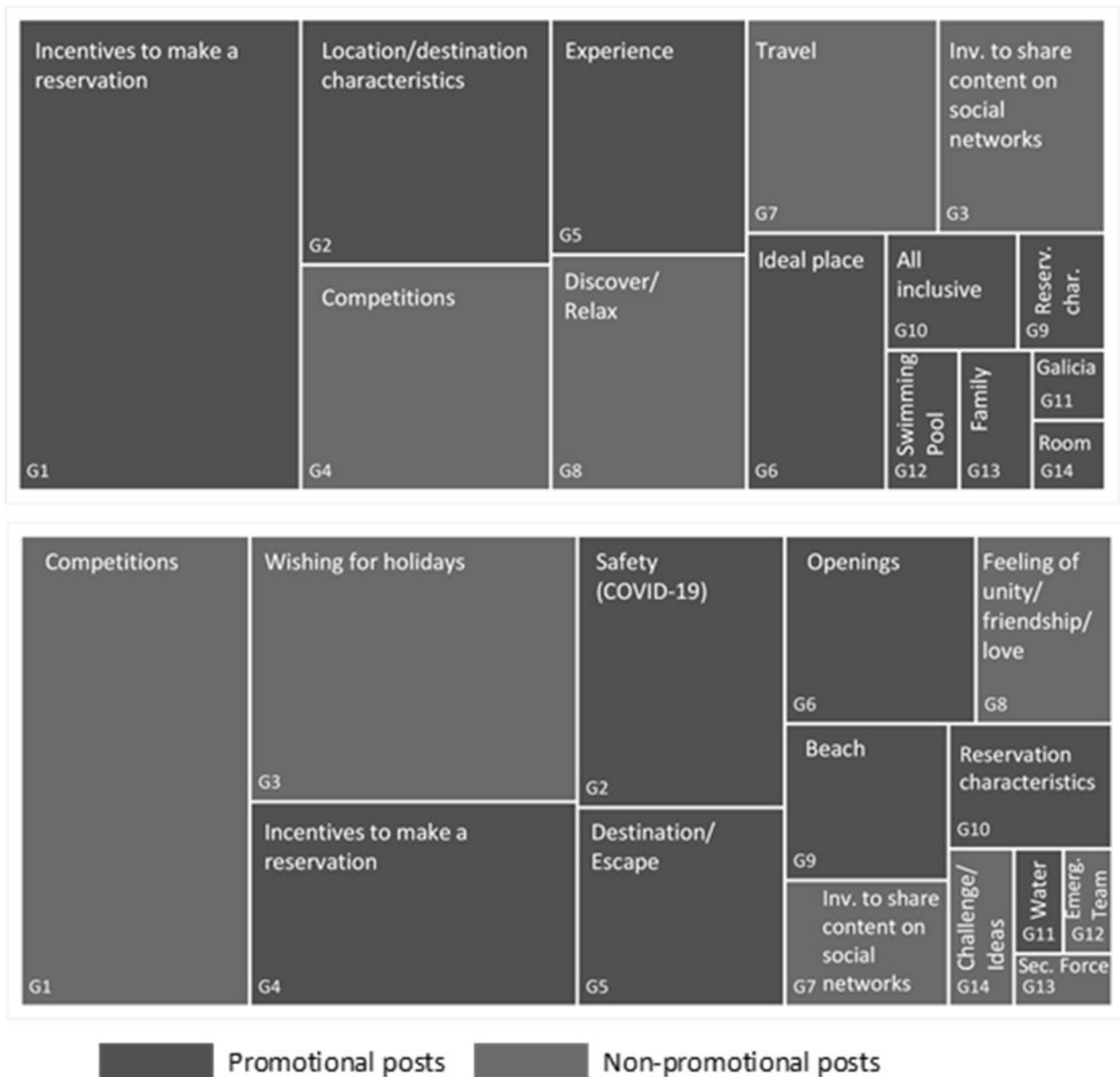


Figure 6. Proportional comparison of topics used in 2019 and 2020

In response to RQ3a, there were 4 topics that remained consistent in the communication strategies of hotel chains on social networks in both years, but with varying importance. However, in the study by Mušanović et al. (2023), only the promotional topic “special offer” was repeated from 2019 to 2020.

It is important to highlight that over 60% of the messages published by hotel chains on Facebook in 2019 were of a promotional nature. This proportion that was also reflected in the results of Molina et al. (2020), which applied to DMOs in Spain, and in the study of Minazzi and Lagrosen (2013) on hotel chains in Europe.

Therefore, in response to RQ3b, our study nevertheless showed a change in trend for non-promotional posts, which increased from 35% in 2019 to 51% in 2020.

For RQ3c, among the topics in 2020 that differed from those found in 2019, three topics were specific to COVID-19: safety, emergency units, and security forces. However, it was necessary to consider other topics directly related to the closure and reopening of establishments due to lockdown: open, feelings of unity/friendship/love, and challenges/ideas (aimed at entertaining people during the lockdown). The study by Kwok et al. (2022) also distinguished between COVID-19 and non-COVID-19 messages.

In their study, they emphasized the weight of messages related to ingratiation, which is similar to the findings in our work regarding emergency units and security forces.

Consequently, to address the second objective, it was observed that COVID-19 changed the discourse of the hotel chains on Facebook. These changes in the structures of the semantic networks were also made evident in the work of Park et al. (2018) on the most popular words and dimensions before and during Hurricane Irma in 2017. In fact, as proposed in the research of Ketter and Avraham (2021), some topics specifically related to the pandemic were noted in 2020, especially one dedicated to COVID-19-safe destinations. However, it must be highlighted that Facebook was not used as the main channel for information about the pandemic, which is in line with the results of Camarinha et al. (2021). In particular, the messages disseminated through Facebook were along the same lines as those found in the research of Ketter and Avraham (2021), such as spreading hope and inspiration, the brotherhood of man, longing, and nostalgia; as well as gratitude towards professionals and volunteers, as found in the study of Camarinha et al. (2021). The importance of this type of topic, which focuses on unity, love, and victim support, was also appreciated in the study of Barbe and Pennington-Gray (2018), in which both a health crisis situation and a terrorist situation were analyzed.

According to Sigala (2020), the nature, unprecedented circumstances, and impacts of COVID-19 are signs of a different crisis. In other circumstances, such as natural disasters, FGC strategies have focused on restoring the image of the tourist destination or establishment (Ketter, 2016; Pennington-Gray et al., 2011). During the pandemic, on the other hand, hotel chains also used Facebook to accompany users, entertain them, and maintain the emotional connection with the brand, responding to the demands of society (Edelman, 2020), all this without forgetting the quest to encourage reservations by maintaining the desire to travel and promoting destinations. Nevertheless, the reduction in the activity level of the Facebook profiles analyzed in 2020 also reflects that they could have better exploited their potential, especially in the period of confinement, in which the number of users and time dedicated to this social media increased by 37% (KANTAR, 2020). The low economic cost of using social networks makes them particularly attractive for small and medium-sized enterprises, which are more vulnerable to crises due to their lower levels of resources. In this sense, government support is crucial to promote the use of social networks by businesses, by

reinforcing infrastructures to accelerate digital services and supporting technological capabilities (Heredia et al., 2022; Japutra & Situmorang, 2021).

5.1 Theoretical contributions

This study contributes to the literature on the crisis in tourism and hospitality in several ways. Firstly, it extends the literature on content strategies in prolonged tourism crises, which may differ from those used in sudden crises such as terrorist attacks, earthquakes, hurricanes, or health-related crises such as the SARS outbreak in Asia and the Ebola epidemic (Ketter & Avraham, 2021).

Secondly, this work contributes to expanding the limited number of studies on FGC within the field of tourism during times of crisis, which have mainly focused on the analysis of DMOs (Ketter, 2016; Ketter & Avraham, 2021; Huertas et al., 2020; Pennington-Gray et al., 2011), with few studies focusing on hotels (Kwok et al., 2022; Mušanović et al., 2023).

Thus, this study adds to the research on audience-focused marketing strategies and the investigation of prolonged image crisis management in tourism, allowing for a comparison of communication actions on social media between destination organizations and accommodation companies. Specifically, it was observed that audience-based strategies aimed at creating affinity were the most popular in both the accommodation sector and tourist destinations to overcome the challenges of COVID-19. This result raises questions about the differences in communication strategies between private and public companies in the tourism sector, as well as in the tourism image repair model, which is designed for short-term crises (Ketter & Avraham, 2021; Sigala, 2020).

In addition, unlike other studies on the effect of COVID-19 on FGC in tourism (Camarinha et al., 2021; Huertas et al., 2020; Ketter & Avraham, 2021; Kwok et al., 2022), we conducted a comparative study with respect to 2019 in order to assess the changes that occurred in social network communications. While the study by Mušanović et al. (2023) also compares the content of messages from 2019 and 2020, it only analyzes the case of 5-star hotels, which have different characteristics and target audience compared to other hotel categories. Therefore, this study is an extension of the literature on the adaptability of tourism companies and their communication on social media, and may contribute to determining the typology of strategies to be used in future prolonged tourism crises, where the same crisis affects both companies and stakeholders.

Furthermore, this work extends the research on FGC during the pandemic by adding a specific analysis of Facebook to the limited number of studies on COVID-19 and FGC in tourism (Kwok et al., 2022; Mušanović et al., 2023). The study by Camarinha et al. (2021) examines this social network together with Twitter in an aggregated manner, without providing specific data for Facebook, while other studies have focused on content published exclusively through Twitter (Huertas et al., 2020) or YouTube (Ketter & Avraham, 2021).

From a methodological perspective, this study is innovative in applying semantic networks to FGC in tourism, as previous studies have focused on UGC (Feizollah et al., 2021; Park et al., 2018; Yoon & Chung, 2018a).

5.2 Managerial implications

Our results revealed that hotel chains changed their discourse on social media during the COVID-19 crisis, adapting the content of their messages. This strategy is coherent when both tourism companies or destinations and the target audience are affected by the same crisis, which disrupts consumers' emotions and changes their mood (Hang et al., 2020).

Although the analyzed companies adapted their FGC, increasing the emotional connection with the brand through non-promotional posts, the full potential of Facebook was not exploited as the number of posts was reduced, as also noted in the work of Kwok et al. (2022). Therefore, we recommend that in future crises, tourism companies, due to their vulnerability, should take advantage of the low cost of using social media to increase their activity with the intention of impacting their brand equity. Additionally, hotel companies do not seem to have fully utilized the power of social media to share COVID-19-related information with their stakeholders, as new pandemic-related topics accounted for only 13% of content. On the positive side, it is worth noting the increase in video posts during the first period of the pandemic, which have a higher degree of vividness, contributing to a real and engaging virtual brand experience (Cvijikj & Michahelles, 2013; De Vries et al., 2012; Hernández-Ortega et al., 2020; Kwok et al., 2022; Shahbaznezhad et al., 2021; Tafesse, 2015). Therefore, the commitment to digitalization in the accommodation sector is considered crucial for the sector's resilience (Duarte Alonso et al., 2020; Japutra & Situmorang, 2021; Jiang & Wen, 2020).

Lifestyle changes driven by the coronavirus crisis have led to significant advances in digital platforms in society. In this regard, as pointed out by Heng Wei et al. (2023), companies need to start emphasizing FGC now that the pandemic has changed the marketing landscape. Therefore, digital marketing through social media should be used not only to communicate good practices in relation to crisis management (Chen et al., 2021), but also to communicate their SDG-related sustainability strategies to their stakeholders after the pandemic is over (Chopra et al., 2022) as part of their non-promotional posts, which can be more effective than exclusively promotional messages (Ge & Gretzel, 2017; Hernández-Ortega et al., 2020; Molina et al., 2020; Pino et al., 2019).

5.3 Limitations and future research avenues

Among the limitations of our study, we can highlight that we focused on only one social network and on a limited number of hotel chains. It could be interesting to analyze the topics of the same firms in other social networks, such as Twitter and Instagram, as well as to increase the number of hotel chains studied.

While the effects and management strategies of the coronavirus crisis in the tourism sector have been analyzed in recent years, the complexity of this situation has meant that other approaches, which could be of significant relevance to other crises, have remained unexplored. The internationalization of the tourism sector, the globalization of the economy and the boom in digitalization have greatly improved the environment for the use of social media as a tool to enhance the resilience of the sector. Therefore, further analysis of the social media messages of companies and their use during a crisis is essential. Future research could consider the use of other semantic content analysis techniques to study the level of interaction of the messages according to the topics assigned by the researchers. The underlying purpose would be to identify the most relevant topics for users and to align communication policies and strategies with those same topics.

REFERENCES

Aguado-Correa, F., Rabadán-Martín, I., & Padilla-Garrido, N. (2022). COVID-19 and the accommodation sector: First measures, and online communications strategies. A multiple case study in a Spanish province. *Investigaciones Turísticas*, 24(24), 172-197. <http://dx.doi.org/10.14198/INTURI2022.24.9>.

- Aljarah, A., Sawaftah, D., Ibrahim, B., & Lahuerta-Otero, E. (2022). The differential impact of user- and firm-generated content on online brand advocacy: Customer engagement and brand familiarity matter. *European Journal of Innovation Management*. <http://dx.doi.org/10.1108/EJIM-05-2022-0259>.
- Al-Omoush, K. S., Ribeiro-Navarrete, S., Lassala, C., & Skare, M. (2022). Networking and knowledge creation: Social capital and collaborative innovation in responding to the COVID-19 crisis. *Journal of Innovation & Knowledge*, 7(2), 100181. <http://dx.doi.org/10.1016/j.jik.2022.100181>.
- Anguera-Torrell, O., Aznar-Alarcón, J. P., & Vives-Perez, J. (2021). COVID-19: Hotel industry response to the pandemic evolution and to the public sector economic measures. *Tourism Recreation Research*, 46(2), 148-157. <http://dx.doi.org/10.1080/02508281.2020.1826225>.
- António, N., & Rita, P. (2021). COVID 19: The catalyst for digital transformation in the hospitality industry? *Tourism & Management Studies*, 17(2), 41-46. <http://dx.doi.org/10.18089/tms.2021.170204>.
- Avraham, E. (2015). Destination image repair during crisis: Attracting tourism during the Arab Spring uprisings. *Tourism Management*, 47, 224-232. <http://dx.doi.org/10.1016/j.tourman.2014.10.003>.
- Barbe, D., & Pennington-Gray, L. (2018). Using situational crisis communication theory to understand Orlando hotels' Twitter response to three crises in the summer of 2016. *Journal of Hospitality and Tourism Insights*, 1(3), 258-275. <http://dx.doi.org/10.1108/JHTI-02-2018-0009>.
- Batra, R., & Keller, K. L. (2016). Integrating marketing communications: New findings, new lessons, and new ideas. *Journal of Marketing*, 80(6), 122-145. <http://dx.doi.org/10.1509/jm.15.0419>.
- Bhrammanachote, W., & Sawangdee, Y. (2021). Sustaining or surviving? An exploratory case study on covid-19's impact towards hotel businesses. *Tourism and Hospitality Management*, 27(2), 273-292. <http://dx.doi.org/10.20867/thm.27.2.3>.
- Camarinha, A. P., Abreu, A. J., Angélico, M. J., Silva, A. F., & Teixeira, S. (2021). A content analysis of social media in tourism during the Covid-19 pandemic. *Smart Innovation, Systems and Technologies*, 208, 532-546. http://dx.doi.org/10.1007/978-981-33-4256-9_49.
- Carvache-Franco, O., Carvache-Franco, M., Carvache-Franco, W., & Iturralde, K. (2023a). Topic and sentiment analysis of crisis communications about the COVID-19 pandemic in Twitter's tourism hashtags. *Tourism and Hospitality Research*, 23(1), 44-59. <http://dx.doi.org/10.1177/14673584221085470>. PMID:37520686.
- Carvache-Franco, O., Carvache-Franco, M., Carvache-Franco, W., & Martin-Moreno, O. (2023b). Topics and destinations in comments on YouTube tourism videos during the Covid-19 pandemic. *PLoS One*, 18(3), e0281100. <http://dx.doi.org/10.1371/journal.pone.0281100>. PMID:36862677.
- Cervellon, M. C., & Galipienzo, D. (2015). Facebook Pages Content, Does it Really Matter? Consumers' Responses to Luxury Hotel Posts with Emotional and Informational Content. *Journal of Travel & Tourism Marketing*, 32(4), 428-437. <http://dx.doi.org/10.1080/10548408.2014.904260>.
- Chen, S., Law, R., & Zhang, M. (2021). Review of research on tourism-related diseases. *Asia Pacific Journal of Tourism Research*, 26(1), 44-58. <http://dx.doi.org/10.1080/10941665.2020.1805478>.
- Chopra, M., Singh, D. S. K., Gupta, A., Aggarwal, K., Gupta, B. B., & Colace, F. (2022). Analysis & prognosis of sustainable development goals using big data-based approach during COVID-19 pandemic. *Sustainable Technology and Entrepreneurship*, 1(2), 100012. <http://dx.doi.org/10.1016/j.stae.2022.100012>.
- Clauset, A., Newman, M. E. J., & Moore, C. (2004). Finding community structure in very large networks. *Physical Review*, 70(6 Pt 2), 06611. PMID:15697438.
- Cvijikj, I. P., & Michahelles, F. (2013). Online engagement factors on Facebook brand pages. *Social Network Analysis and Mining*, 3(4), 843-861. <http://dx.doi.org/10.1007/s13278-013-0098-8>.
- De Vries, L., Gensler, S., & Leeftang, P. S. H. (2012). Popularity of Brand Posts on Brand Fan Pages: An Investigation of the Effects of Social Media Marketing.

Journal of Interactive Marketing, 26(2), 83-91. <http://dx.doi.org/10.1016/j.intmar.2012.01.003>.

Doerfel, M. L. (1998). What constitutes semantic network analysis? A comparison of research and methodologies. *Connections*, 21(2), 27-36. https://assets.noviams.com/novi-file-uploads/insna/Connections_Archive/1998_Volume_21_Issue_2.pdf

Duarte Alonso, A., Kok, S. K., Bressan, A., O'Shea, M., Sakellarios, N., Koresis, A., Buitrago Solis, M. A., & Santoni, L. J. (2020). COVID-19, aftermath, impacts, and hospitality firms: An international perspective. *International Journal of Hospitality Management*, 91(July), 102654. <http://dx.doi.org/10.1016/j.ijhm.2020.102654>. PMID:32863526.

Eddington, S. M. (2018). The communicative constitution of hate organizations online: A semantic network analysis of "Make America Great Again.". *Social Media + Society*, 4(3). <http://dx.doi.org/10.1177/2056305118790763>.

Edelman. (2020). *Special Report: Brand Trust and the Coronavirus Pandemic*. <https://www.edelman.com/sites/g/files/aatuss191/files/2020-03/2020%20Edelman%20Trust%20Barometer%20Brands%20and%20the%20Coronavirus.pdf>

Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management*, 22(2), 135-147. [http://dx.doi.org/10.1016/S0261-5177\(00\)00048-0](http://dx.doi.org/10.1016/S0261-5177(00)00048-0).

Feizollah, A., Mostafa, M. M., Sulaiman, A., Zakaria, Z., & Firdaus, A. (2021). Exploring halal tourism tweets on social media. *Journal of Big Data*, 8(1), 1-18. <http://dx.doi.org/10.1186/s40537-021-00463-5>. PMID:33425651.

Fernández-Villarán, A., & Uresandi, N. (2022). Inherent commitment to sustainability among basque adventure tourism enterprises despite crisis. *Cuadernos de Turismo*, (50), 1-20. <http://dx.doi.org/10.6018/turismo.541841>.

Flores-Ruiz, D., Elizondo-Salto, A., & Barroso-González, M. D. L. O. (2021). Using social media in tourist sentiment analysis: A case study of Andalusia during the Covid-19 pandemic. *Sustainability (Switzerland)*, 13(7), 1-19. <http://dx.doi.org/10.3390/su13073836>.

Ge, J., & Gretzel, U. (2017). The role of humour in driving customer engagement. *Information and Communication*

Technologies in Tourism, 2017, 461-474. http://dx.doi.org/10.1007/978-3-319-51168-9_33.

Ge, J., & Gretzel, U. (2018). Impact of humour on firm-initiated social media conversations. *Information Technology & Tourism*, 18(1-4), 61-83. <http://dx.doi.org/10.1007/s40558-017-0097-0>.

Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: A rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 29(1), 1-20. <http://dx.doi.org/10.1080/09669582.2020.1758708>.

Gretzel, U., Fuchs, M., Baggio, R., Hoepken, W., Law, R., Neidhardt, J., Pesonen, J., Zanker, M., & Xiang, Z. (2020). e-Tourism beyond COVID-19: A call for transformative research. *Information Technology & Tourism*, 22(2), 187-203. <http://dx.doi.org/10.1007/s40558-020-00181-3>.

Guaita Martínez, J. M., Carracedo, P., Gorgues Comas, D., & Siemens, C. H. (2022). An analysis of the blockchain and COVID-19 research landscape using a bibliometric study. *Sustainable Technology and Entrepreneurship*, 1(1), 100006. <http://dx.doi.org/10.1016/j.stae.2022.100006>.

Hang, H., Aroean, L., & Chen, Z. (2020). Building emotional attachment during COVID-19. *Annals of Tourism Research*, 83, 103006. PMID:32834221.

Hays, S., Page, S. J., & Buhalis, D. (2013). Social media as a destination marketing tool: Its use by national tourism organisations. *Current Issues in Tourism*, 16(3), 211-239. <http://dx.doi.org/10.1080/13683500.2012.662215>.

Heng Wei, L., Chuan Huat, O., & Arumugam, P. V. (2023). Social media communication with intensified pandemic fears: Evaluating the relative impact of user- and firm-generated content on brand loyalty. *Asia-Pacific Journal of Business Administration*, 15(2), 161-187. <http://dx.doi.org/10.1108/APJBA-07-2021-0319>.

Heredia, J., Castillo-Vergara, M., Geldes, C., Carbajal Gamarra, F. M., Flores, A., & Heredia, W. (2022). How do digital capabilities affect firm performance? The mediating role of technological capabilities in the "new normal.". *Journal of Innovation and Knowledge*, 7(2), 100171. <http://dx.doi.org/10.1016/j.jik.2022.100171>.

- Hernández-Ortega, B., San Martín, H., Herrero, Á., & Franco, J. L. (2020). What, how and when? Exploring the influence of firm-generated content on popularity in a tourism destination context. *Journal of Destination Marketing & Management*, 18(November), 100504. <http://dx.doi.org/10.1016/j.jdmm.2020.100504>.
- Hong, Y. J., Shin, D., & Kim, J. H. (2016). High/low reputation companies' dialogic communication activities and semantic networks on Facebook: A comparative study. *Technological Forecasting and Social Change*, 110, 78-92. <http://dx.doi.org/10.1016/j.techfore.2016.05.003>.
- HOSTELTUR. (2021). *Ranking Hosteltur de grandes cadenas hoteleras 2020*. https://www.hosteltur.com/139934_ranking-hosteltur-de-grandes-cadenas-hoteleras-2020.html
- Huertas, A., & Marine-Roig, E. (2016). User reactions to destination brand contents in social media. *Information Technology & Tourism*, 15(4), 291-315. <http://dx.doi.org/10.1007/s40558-015-0045-9>.
- Huertas, A., Oliveira, A., Giroto, M., Oliveira, A., & Giroto, M. (2020). Gestión comunicativa de crisis de las oficinas nacionales de turismo de España e Italia ante la Covid-19. *El Profesional de la Información*, 29(4), 1-18. <http://dx.doi.org/10.3145/epi.2020.jul.10>.
- Jabreel, M., Moreno, A., & Huertas, A. (2017). Semantic comparison of the emotional values communicated by destinations and tourists on social media. *Journal of Destination Marketing & Management*, 6(3), 170-183. <http://dx.doi.org/10.1016/j.jdmm.2016.03.004>.
- Jang, J., Lee, E., & Jung, H. (2022). A study of consumers' perceptions of take-out food before and after the COVID-19 outbreak: Applying big data analysis. *Sustainability (Switzerland)*, 14(19), 1-23. <http://dx.doi.org/10.3390/su141911889>.
- Japutra, A., & Situmorang, R. (2021). The repercussions and challenges of COVID-19 in the hotel industry: Potential strategies from a case study of Indonesia. *International Journal of Hospitality Management*, 95, 102890. <http://dx.doi.org/10.1016/j.ijhm.2021.102890>. PMID:36540685.
- Japutra, A., Higuera-Castillo, E., & Liebana-Cabanillas, F. (2022a). Building customer engagement in mobile commerce through need fulfillment: An approach of self-determination theory. *Journal of Strategic Marketing*. In press. <http://dx.doi.org/10.1080/0965254X.2022.2152476>.
- Japutra, A., Molinillo, S., Utami, A. F., & Adi Ekaputra, I. (2022b). Exploring the effect of relative advantage and challenge on customer engagement behavior with mobile commerce applications. *Telematics and Informatics*, 72, 101841. <http://dx.doi.org/10.1016/j.tele.2022.101841>.
- Japutra, A., Utami, A. F., Molinillo, S., & Ekaputra, I. A. (2021). Influence of customer application experience and value in use on loyalty toward retailers. *Journal of Retailing and Consumer Services*, 59, 102390. <http://dx.doi.org/10.1016/j.jretconser.2020.102390>.
- Jiang, Y., & Wen, J. (2020). Effects of COVID-19 on hotel marketing and management: A perspective article. *International Journal of Contemporary Hospitality Management*, 32(8), 2563-2573. <http://dx.doi.org/10.1108/IJCHM-03-2020-0237>.
- Kang, G. J., Ewing-Nelson, S. R., Mackey, L., Schlitt, J. T., Marathe, A., Abbas, K. M., & Swarup, S. (2017). Semantic network analysis of vaccine sentiment in online social media. *Vaccine*, 35(29), 3621-3638. <http://dx.doi.org/10.1016/j.vaccine.2017.05.052>. PMID:28554500.
- KANTAR. (2020). *COVID-19 Barometer: Consumer attitudes, media habits and expectations*. <https://www.kantar.com/Inspiration/Coronavirus/COVID-19-Barometer-Consumer-attitudes-media-habits-and-expectations>
- Kemp, S. (2021). *Digital 2021 España*. <https://wearesocial.com/es/digital-2021-espana>
- Ketter, E. (2016). Destination image restoration on Facebook : The case study of Nepal's Gurkha Earthquake. *Journal of Hospitality and Tourism Management*, 28, 66-72. <http://dx.doi.org/10.1016/j.jhtm.2016.02.003>.
- Ketter, E., & Avraham, E. (2021). #StayHome today so we can #TravelTomorrow: Tourism destinations' digital marketing strategies during the Covid-19 pandemic. *Journal of Travel & Tourism Marketing*, 38(May), 819-832. <http://dx.doi.org/10.1080/10548408.2021.1921670>.
- Kim, W. H., Park, E., & Kim, S. B. (2023). Understanding the role of firm-generated content by hotel segment: The

case of Twitter. *Current Issues in Tourism*, 26(1), 122-136. <http://dx.doi.org/10.1080/13683500.2021.2003759>.

Kumar, A., Bezawada, R., Rishika, R., Janakiraman, R., & Kannan, P. K. (2016). From social to sale: The effects of firm-generated content in social media on customer behavior. *Journal of Marketing*, 80(1), 7-25. <http://dx.doi.org/10.1509/jm.14.0249>.

Kumar, P., Mishra, J. M., & Rao, Y. V. (2022). Analysing tourism destination promotion through Facebook by Destination Marketing Organizations of India. *Current Issues in Tourism*, 25(9), 1416-1431. <http://dx.doi.org/10.1080/13683500.2021.1921713>.

Kwok, L., Lee, J., & Han, S. H. (2022). Crisis Communication on Social Media: What Types of COVID-19 Messages Get the Attention? *Cornell Hospitality Quarterly*, 63(4), 528-543. <http://dx.doi.org/10.1177/19389655211028143>.

Law, R., Leung, D., & Chan, I. C. C. (2020). Progression and development of information and communication technology research in hospitality and tourism: A state-of-the-art review. *Information and Communication Technology Research*, 32(2), 511-534. <http://dx.doi.org/10.1108/IJCHM-07-2018-0586>.

Leung, D., Law, R., Van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel & Tourism Marketing*, 30(1-2), 3-22. <http://dx.doi.org/10.1080/10548408.2013.750919>.

Leung, X. Y., Bai, B., & Erdem, M. (2017). Hotel social media marketing: A study on message strategy and its effectiveness. *Journal of Hospitality and Tourism Technology*, 8(2), 239-255. <http://dx.doi.org/10.1108/JHTT-02-2017-0012>.

Li, J., Xu, L., Tang, L., Wang, S., & Li, L. (2018). Big data in tourism research: A literature review. *Tourism Management*, 68, 301-323. <http://dx.doi.org/10.1016/j.tourman.2018.03.009>.

Liébana-Cabanillas, F., Japutra, A., Molinillo, S., Singh, N., & Sinha, N. (2020). Assessment of mobile technology use in the emerging market: Analyzing intention to use m-payment services in India. *Telecommunications Policy*, 44(9), 102009. <http://dx.doi.org/10.1016/j.telpol.2020.102009>.

Liu, W., Lai, C. H., & Xu, W. (2018). Tweeting about emergency: A semantic network analysis of government organizations' social media messaging during Hurricane Harvey. *Public Relations Review*, 44(5), 807-819. <http://dx.doi.org/10.1016/j.pubrev.2018.10.009>.

Luarn, P., Lin, Y. F., & Chiu, Y. P. (2015). Influence of Facebook brand-page posts on online engagement. *Online Information Review*, 39(4), 505-519. <http://dx.doi.org/10.1108/OIR-01-2015-0029>.

Mahardika, H., Thomas, D., Ewing, M. T., & Japutra, A. (2019). Experience and facilitating conditions as impediments to consumers' new technology adoption. *International Review of Retail, Distribution and Consumer Research*, 29(1), 79-98. <http://dx.doi.org/10.1080/09593969.2018.1556181>.

Mellinas, J. P., Martínez María-Dolores, S. M., & Bernal García, J. J. (2014). Uso de las redes sociales en los hoteles de la costa española. *Investigaciones Turísticas*, (7), 87-101. <http://dx.doi.org/10.14198/INTURI2014.7.05>.

Messabia, N., Fomi, P.-R., & Kooli, C. (2022). Managing restaurants during the COVID-19 crisis: Innovating to survive and prosper. *Journal of Innovation & Knowledge*, 7(4), 100234. <http://dx.doi.org/10.1016/j.jik.2022.100234>.

Minazzi, R., & Lagrosen, S. (2013). Investigating social media marketing in the hospitality industry: Facebook and European Hotels. *Information and Communication Technologies in Tourism, 2014*, 145-157. http://dx.doi.org/10.1007/978-3-319-03973-2_11.

Molina, A., Gómez, M., Lyon, A., Aranda, E., & Loibl, W. (2020). What content to post? Evaluating the effectiveness of Facebook communications in destinations. *Journal of Destination Marketing & Management*, 18, 100498. <http://dx.doi.org/10.1016/j.jdmm.2020.100498>.

Molinillo, S., Navarro-García, A., Anaya-Sánchez, R., & Japutra, A. (2020). The impact of affective and cognitive app experiences on loyalty towards retailers. *Journal of Retailing and Consumer Services*, 54, 101948. <http://dx.doi.org/10.1016/j.jretconser.2019.101948>.

Montaguti, E., Valentini, S., & Vecchioni, F. (2023). Content that engages your customers: The role of brand congruity and

- promotions in social media. *Journal of Interactive Marketing*, 58(1), 16-33. <http://dx.doi.org/10.1177/10949968221129817>.
- Moral Cuadra, S., Cañero Morales, P., & Orgaz Agüera, F. (2014). Turismo 2.0 y reputación online. El caso de los hoteles de la ciudad de Granada (España). *TURyDES. Revista Turismo y Desarrollo Local*, 7(17), 1-13.
- Moro, S., & Rita, P. (2018). Brand strategies in social media in hospitality and tourism. *International Journal of Contemporary Hospitality Management*, 30(1), 343-364. <http://dx.doi.org/10.1108/IJCHM-07-2016-0340>.
- Moro, S., Rita, P., & Vala, B. (2016). Predicting social media performance metrics and evaluation of the impact on brand building: A data mining approach. *Journal of Business Research*, 69(9), 3341-3351. <http://dx.doi.org/10.1016/j.jbusres.2016.02.010>.
- Mušanović, J., Dorčić, J., & Gregorić, M. (2023). Corporate communication on social media: A case study before and during pandemic COVID-19. *Corporate Communications*, 28(4), 582-598. <http://dx.doi.org/10.1108/CCIJ-07-2022-0085>.
- Nilashi, M., Asadi, S., Minaei-Bidgoli, B., Ali Abumalloh, R., Samad, S., Ghabban, F., & Ahani, A. (2021). Recommendation agents and information sharing through social media for coronavirus outbreak. *Telematics and Informatics*, 61(February), 101597. <http://dx.doi.org/10.1016/j.tele.2021.101597>. PMID:34887615.
- Novelli, M., Gussing Burgess, L., Jones, A., & Ritchie, B. W. (2018). 'No Ebola...still doomed' – The Ebola-induced tourism crisis. *Annals of Tourism Research*, 70(April), 76-87. <http://dx.doi.org/10.1016/j.annals.2018.03.006>. PMID:32572288.
- O'Regan, M., & Choe, J. (2023). #overtourism on Twitter: A social movement for change or an echo chamber? *Current Issues in Tourism*, 26(7), 1082-1095. <http://dx.doi.org/10.1080/13683500.2022.2047161>.
- Pachucki, C., Grohs, R., & Scholl-Grissemann, U. (2022). Is nothing like before? COVID-19-evoked changes to tourism destination social media communication. *Journal of Destination Marketing & Management*, 23, 100692. <http://dx.doi.org/10.1016/j.jdmm.2022.100692>.
- Page, S., Yeoman, I., Munro, C., Connell, J., & Walker, L. (2006). A case study of best practice - Visit Scotland's prepared response to an influenza pandemic. *Tourism Management*, 27(3), 361-393. <http://dx.doi.org/10.1016/j.tourman.2006.01.001>.
- Park, D., Kim, W. G., & Choi, S. (2018). Application of social media analytics in tourism crisis communication. *Current Issues in Tourism*, 22(15), 1810-1824. <http://dx.doi.org/10.1080/13683500.2018.1504900>.
- Park, S. H., Yoon, S. W., & Chung, S. W. (2020). Social and semantic network analysis of Facebook pages: The case of Brexit and Remain leaders. *Asia Europe Journal*, 18(4), 479-492. <http://dx.doi.org/10.1007/s10308-019-00567-x>.
- Pennington-Gray, L., London, B., & Cahyanto, I. (2011). Expanding the tourism crisis management planning framework to include social media: Lessons from the Deepwater horizon oil spill 2010. *International Journal of Tourism Anthropology*, 1(3/4), 239-253. <http://dx.doi.org/10.1504/IJTA.2011.043708>.
- Pino, G., Peluso, A. M., Del Vecchio, P., Ndou, V., Passiante, G., & Guido, G. (2019). A methodological framework to assess social media strategies of event and destination management organizations. *Journal of Hospitality Marketing & Management*, 28(2), 189-216. <http://dx.doi.org/10.1080/19368623.2018.1516590>.
- Poulis, A., Rizomyliotis, I., & Konstantoulaki, K. (2019). Do firms still need to be social? Firm generated content in social media. *Information Technology & People*, 32(2), 387-404. <http://dx.doi.org/10.1108/ITP-03-2018-0134>.
- Rabadán-Martín, I., Padilla-Garrido, N., & Aguado-Correa, F. (2020). Variables relacionadas con el número y elección de las redes sociales de los hoteles andaluces de 4 y 5 estrellas. *Cuadernos de Turismo*, 46(46), 93-111. <http://dx.doi.org/10.6018/turismo.451521>.
- Rafique, M. A., Hou, Y., Chudhery, M. A. Z., Waheed, M., Zia, T., & Chan, F. (2022). Investigating the impact of pandemic job stress and transformational leadership on innovative work behavior: The mediating and moderating role of knowledge sharing. *Journal of Innovation and Knowledge*, 7(3), 100214. <http://dx.doi.org/10.1016/j.jik.2022.100214>.

- Rather, R. A. (2021). Monitoring the impacts of tourism-based social media, risk perception and fear on tourist's attitude and revisiting behaviour in the wake of COVID-19 pandemic. *Current Issues in Tourism*, 0(0), 1-9. <http://dx.doi.org/10.1080/13683500.2021.1884666>.
- Rita, P., Moro, S., & Cavalcanti, G. (2022). The impact of COVID-19 on tourism: Analysis of online reviews in the airlines sector. *Journal of Air Transport Management*, 104(August), 102277. <http://dx.doi.org/10.1016/j.jairtraman.2022.102277>.
- Ritchie, B. W. (2004). Chaos, crises and disasters: A strategic approach to crisis management in the tourism industry. *Tourism Management*, 25(6), 669-683. <http://dx.doi.org/10.1016/j.tourman.2003.09.004>.
- Ritchie, B. W., & Jiang, Y. (2019). A review of research on tourism risk, crisis and disaster management: Launching the annals of tourism research curated collection on tourism risk, crisis and disaster management. *Annals of Tourism Research*, 79, 102812. <http://dx.doi.org/10.1016/j.annals.2019.102812>.
- Roberts, C. W. (2000). A conceptual framework for quantitative text analysis. *Quality & Quantity*, 34(3), 259-274. <http://dx.doi.org/10.1023/A:1004780007748>.
- Santiago, J., Borges-Tiago, M. T., & Tiago, F. (2022). Is firm-generated content a lost cause? *Journal of Business Research*, 139, 945-953. <http://dx.doi.org/10.1016/j.jbusres.2021.10.022>.
- Sevin, H. E. (2014). Understanding cities through city brands: City branding as a social and semantic network. *Cities (London, England)*, 38, 47-56. <http://dx.doi.org/10.1016/j.cities.2014.01.003>.
- Shahbaznezhad, H., Dolan, R., & Rashidirad, M. (2021). The role of social media content format and platform in users' engagement behavior. *Journal of Interactive Marketing*, 53, 47-65. <http://dx.doi.org/10.1016/j.intmar.2020.05.001>.
- Sharma, A., Hazan, A., & Mohanty, P. (2022). *Covid 19 and the Tourism Industry: Sustainability, resilience and new directions* Routledge. <http://dx.doi.org/10.4324/9781003207467>.
- Shen, B., & Bissell, K. (2013). Social media, social me: A content analysis of beauty companies' use of Facebook in marketing and branding. *Journal of Promotion Management*, 19(5), 629-651. <http://dx.doi.org/10.1080/10496491.2013.829160>.
- Sigala, M. (2011). Social media and crisis management in tourism: Applications and implications for research. *Information Technology & Tourism*, 13(4), 269-283. <http://dx.doi.org/10.3727/109830512X13364362859812>.
- Sigala, M. (2020). Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research. *Journal of Business Research*, 117(June), 312-321. <http://dx.doi.org/10.1016/j.jbusres.2020.06.015>. PMID:32546875.
- Smith, M., Milic-Frayling, N., Shneiderman, B., Mendes Rodrigues, E., Leskovec, J., & Dunne, C. (2010). *NodeXL: A free and open network overview, discovery and exploration add-in for Excel 2007/2010/2013/2016*. Social Media Research Foundation. <https://www.smrfoundation.org>
- Smith, S. B., & Smith, B. G. (2022). What amounts to a paracrisis? Interactivity as a lens for evaluating social media-propagated crises. *Journal of Contingencies and Crisis Management*, 30(2), 204-216. <http://dx.doi.org/10.1111/1468-5973.12374>.
- Spanish Statistical Office – INE. (2020). *Cuenta Satélite del Turismo de España (CSTE). Revisión estadística 2019. Serie 2016 – 2019*. Instituto Nacional de Estadística. https://www.ine.es/prensa/cst_2019.pdf
- Tafesse, W. (2015). Content strategies and audience response on Facebook brand pages. *Marketing Intelligence & Planning*, 33(6), 927-943. <http://dx.doi.org/10.1108/MIP-07-2014-0135>.
- Tang, L., Bie, B., & Zhi, D. (2018). Tweeting about measles during stages of an outbreak: A semantic network approach to the framing of an emerging infectious disease. *American Journal of Infection Control*, 46(12), 1375-1380. <http://dx.doi.org/10.1016/j.ajic.2018.05.019>. PMID:29929837.
- Utami, A. F., Ekaputra, I. A., Japutra, A., & Van Doorn, S. (2022). The role of interactivity on customer engagement in mobile e-commerce applications. *International Journal of Market Research*, 64(2), 269-291. <http://dx.doi.org/10.1177/14707853211027483>.

- Wan, F., & Ren, F. (2017). The effect of firm marketing content on product sales: Evidence from a mobile social media platform. *Journal of Electronic Commerce Research*, 18(4), 288-302.
- Wang, R., & Xu, W. (2022). Hashtag framing and stakeholder targeting: An affordance perspective on China's digital public diplomacy campaign during COVID-19. *Journal of Information Technology & Politics*, 20(3), 250-268. <http://dx.doi.org/10.1080/19331681.2022.2096742>.
- Wong, A. K. F., Kim, S., Liu, Y. Y. J., & Grace Baah, N. (2023). COVID-19 research in hospitality and tourism: Critical analysis, reflection, and lessons learned. *Journal of Hospitality & Tourism Research (Washington, D.C.)*, 109634802311560. <http://dx.doi.org/10.1177/10963480231156079>.
- World Health Organization. (2020). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-COVID-19---11-march-2020>
- World Tourism Organization. (2021). *COVID-19 and Tourism*. <https://www.unwto.org/es/covid-19-y-sector-turistico-2020>
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179-188. <http://dx.doi.org/10.1016/j.tourman.2009.02.016>.
- Xiong, Y., Cho, M., & Boatwright, B. (2019). Hashtag activism and message frames among social movement organizations: Semantic network analysis and thematic analysis of Twitter during the #MeToo movement. *Public Relations Review*, 45(1), 10-23. <http://dx.doi.org/10.1016/j.pubrev.2018.10.014>.
- Yoo, K. H., & Lee, W. (2015). Use of Facebook in the US heritage accommodations sector: An exploratory study. *Journal of Heritage Tourism*, 10(2), 191-201. <http://dx.doi.org/10.1080/1743873X.2014.985228>.
- Yoon, S. W., & Chung, S. W. (2018a). Promoting a world heritage site through social media: Suwon City's Facebook promotion strategy on Hwaseong Fortress (in South Korea). *Sustainability (Switzerland)*, 10(7), 2189. <http://dx.doi.org/10.3390/su10072189>.
- Yoon, S. W., & Chung, S. W. (2018b). Semantic network analysis of legacy news media perception in South Korea: The case of PyeongChang 2018. *Sustainability (Switzerland)*, 10(11), 4027. <http://dx.doi.org/10.3390/su10114027>.
- Youn, C., & Jung, H. J. (2021). Semantic network analysis to explore the concept of sustainability in the apparel and textile industry. *Sustainability*, 13(3813), 1-17. <http://dx.doi.org/10.3390/su13073813>.
- Yu, B. (2022). How consumer opinions are affected by marketers: An empirical examination by deep learning approach. *Journal of Research in Interactive Marketing*, 16(4), 601-614. <http://dx.doi.org/10.1108/JRIM-04-2021-0106>.
- Yu, M., Li, Z., Yu, Z., He, J., & Zhou, J. (2020). Communication related health crisis on social media: A case of COVID-19 outbreak. *Current Issues in Tourism*, 24(19), 2699-2705. <http://dx.doi.org/10.1080/13683500.2020.1752632>.
- Zeng, B., & Gerritsen, R. (2014). What do we know about social media in tourism? A review. *Tourism Management Perspectives*, 10, 27-36. <http://dx.doi.org/10.1016/j.tmp.2014.01.001>.
- Zeng, B., Carter, R. W., & De Lacy, T. (2005). Short-term perturbations and tourism effects: The case of SARS in China. *Current Issues in Tourism*, 8(4), 306-322. <http://dx.doi.org/10.1080/13683500508668220>.
- Zenker, S., & Kock, F. (2020). The coronavirus pandemic – A critical discussion of a tourism research agenda. *Tourism Management*, 81(April), 104164. <http://dx.doi.org/10.1016/j.tourman.2020.104164>. PMID:32518437.

SUPPLEMENTARY MATERIAL

Supplementary material accompanies this paper.

Supplementary Data 1 – database

Supplementary Data 2 – translated database

Supplementary Data 3 – list of words and n-grams

Supplementary Data 4 – list of co-occurrence terms

Supplementary Data 5 – NodeXL results

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