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Is hosting tourism events a sustainable way of destination branding: Evidences from Sanya, China

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Abstract: The existing literature has revealed the questionable economic benefits of hosting such events, while scholars would still hold an optimistic view of the benefits of place branding and promotion. This paper raises a critical question to this view by examining the effectiveness of hosting pro-tourism events for destination branding. This paper collects massive tourist online reviews and conducts sentiment analysis to examine this issue based on the case of Sanya city in China. The study finds that: (1) there is no solid evidence to show that Sanya’s tourism-related events have a significant positive impact on its destination branding; (2) in the short term, that is fewer than six months, culture-related events were more effective in improving the destination’s image; (3) in the long term, that is, from six months to two years, sports-related events had more positive sentiment impacts, while negative sentiment impacts were largely the result of tourist rip-off incidents. In doing so, this paper argues that hosting tourism events would not be a sustainable way of destination branding, unless the event is meant for other interests. This effort provides an innovative approach for understanding the impacts of tourism events to destination branding in a more critical manner.

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The authors are in a research lab called Tourism Emotional Geography initiated by Dr LIU Yi. This reported research is part of our work of testing the utility of tourist’s reviews in various tourism contexts.

PUBLIC INTEREST STATEMENT

People will read useful reviews while making decision of a tour. But it is still unclear that whether hosting a pro-tourism event can attract tourists to write more good experiences online so that improving the destination image. Our research collect more than a large volume of reviews written by tourists to measure whether the hosted pro-tourism events will improve the worth of mouth of a destination. We found that only a few sport-related events had such an positive impact, while others had very limited influences to the worth of mouth of the destination. Therefore, our research reminds the officials or managers in governments, industries or public institutions to have a critical mind before hosting a pro-tourism event, if they want to improve the destination image.
1. Introduction

Organizing pro-tourism events has been frequently used as an effective policy for destination tourism promotion. Whether these tourism events can be economically and socially efficient have attracted scholarly attention in recent years in various disciplines, including economics, management and sociology (Fourie & Santana-Gallego, 2011). Traditional event research focuses on one particular event, analyzing the perception of events by experiments or questionnaires, and the selected events are simply positive or negative events (Dansero & Puttilli, 2010). These studies have generally assumed that tourists are affected by travel events and intentionally included validated items that lead to biased conclusions. In reality, however, events occurring in cities are often multifaceted, either organized or unexpected, and may lead to positive, negative or mixed outcomes (Olberding & Olberding, 2014). Unfortunately, most of the contemporary studies have showed that pro-tourism events, particularly the mega ones, are never economically efficient based on various experiences from North America, Europe or Asia (Alonso-Almeida, Borrajo-Millán, & Yi, 2019; Koens, Postma, & Papp, 2018). Despite of this, some scholars would still hold an optimistic view of hosting such events because they can polish destination image and promote E-WOM (word of mouth) for destination branding (Luo & Yang, 2010). However, how to measure the effectiveness of the events’ impacts via reliable data rather than local self-reporting is an ongoing challenge for academia and tourism management and development industries. Many of the hosted events may be a lavish investment that hardly realizes sufficient economic and social benefits, apart from the success report published by the host governmental agency. This study therefore rises a critical question that whether tourism events can be a sustainable way of destination branding. Taking advantages of available tourism big data, or UGC (user-generated content) nowadays, this paper examines the effectiveness of tourism events by measuring the positive tourists’ emotions that are embedded in the reviews written by them.

Big-data analytical technologies have already been explored in many disciplines, and their emergence in tourism facilitates the analysis of tourism information. These technologies contribute to an understanding of the status quo in regional tourism development and the evaluation of the effectiveness of tourism marketing strategies and provide guidance on targeted sustainable development (Fuchs, Höpken, & Lexhagen, 2014; Miah, Vu, Gammack, & McGrath, 2017). Such analysis has several advantages for research in tourism management. First, big data in the form of tourist reviews are representative and persuasive. Additionally, it enables real-time observations of travel trends, which is a good way to study and forecast tourism activities (Xiang, Schwartz, Gerdes, & Uysal, 2015). Existing research have proved that UGCs are relatively reliable data sources and can be used in analyzing tourists’ preferences, experiences, and perceptions by means of word-frequency analysis and sentiment analysis (Alonso-Almeida et al., 2019).

This paper selects the city of Sanya as case study place. In the past years, Sanya has actively held various events in response to the government’s call for making Hainan an “International Tourism Island”, which has attracted many tourists and has promoted local development. For data collection, this study selected five well-known tourist social network sites in China (Baidu Travel, Mafengwo, Tripadvisor, Qunar, Ctrip), reviewed the tourist reviews of Sanya from 1 September 2013, to 31 August 2016, collected 129,791 reviews in total, and carried out a quantitative analysis of tourist emotions. In addition, the study collected 59 tourism events that occurred in Sanya during the same time period and established a scoring system to quantify the impact of tourism events in terms of positive, negative and neutral sentiments. On this basis, correlation analysis was carried out to measure the impacts of tourism events, as reflected by the tourists’ emotions expressed in their reviews.
This paper is organized by six sections. The next section offers a cross-disciplinary review of themes related to this study. Methods and data are introduced in the third section, and the results in the fourth section. The fifth section analyzes different types of impacts. The final section summarizes the conclusions and discusses the implications.

2. Tourism events and tourist sentiment research in a big-data context
Tourism big data has become a hot research trend currently. Research in this vein mainly uses machine learning supplemented by manual content analysis. Hence this section starts with reviewing the literature about tourism big data and then move to the studies about tourist emotion and tourism events, as Figure 1 have showed.

2.1. Tourism big data
Big data is a term encompassing the use of techniques to capture, process, analyze and visualize potentially large datasets in a reasonable timeframe not possible with standard information technologies (NESSI, 2012). Recently, big data has exhibited three key characteristics (known as the 3V's), which are variety, volume, and velocity (Bryant, Katz, & Lazowska, 2008).

Tourism big data is mainly presented in the form of travel texts, photos, and points of interest. With the widespread use of social media, the era of smart tourism has brought about the promotion of mobile intelligent terminals, cloud computing, etc. Smarter tourism could bridge the gap between big data and the tourism industry, by means of collecting, storing, mining, and managing tourism big data. The development of tourism big data mainly lies in data-mining, data visualization, and data analysis libraries (Miah et al., 2017; Xiang et al., 2015).

In terms of technology, data mining is a process of extraction and summarization of a large amount of data, especially fuzzy data. Data mining techniques include information correlation analysis, information sequence patterns, cluster analysis, and anomaly detection (Kusiak, Kern, Kernstine, &
Big data mining is different from traditional data mining, mainly because it changes focus from causal analysis to relevance analysis (Viktor & Kenneth, 2013). Traditional data analysis methods, such as factor analysis and cluster analysis, have been applied in the field of big data, yet efficiency is difficult to achieve when processing large data sets. Therefore, there are some technologies that are specifically designed to manage and analyze big data. Big data mining processing can be divided into two types: batch processing and stream processing. Data in the former process are first stored and then processed, and data in the latter process are directly processed (Shahrivari, 2014). Due to the different forms of big data, the data mining process is not always the same.

For mining tourism big data, we can use correlation analyses to identify high probability patterns or cluster data, in order to analyze the similarity of tourism big data and to store the data. There are several major aspects of this application, including the mining of tourist information, tapping potential customers based on cluster analysis, optimizing routes, or personalizing travel plans (Chen, Arefin, Chen, & Morimoto, 2013; Zhou, Xu, & Kimmons, 2015).

In this paper, the review texts produced by tourists on travel websites are used for tourism big data research. Based on the content of tourists' reviews, it is possible to understand whether visitors are influenced by tourism events and what causes the emotional fluctuation. Therefore, this paper decided to use this new source of data to explore a traditional topic in order to evaluate the performance of event promotions of a destination in a new context.

2.2. Tourists' emotions based on UGC
Emotions are immediate and emotional psychological responses to the perception of the outside world, which are contextual and unstable. After the superposition of many emotional experiences, people will form a more rational, organized and stable experience attitude, which is called affection. Therefore, travel reviews in written language can be regarded as expressions of psychological attitudes somewhere between emotion and affection. However, due to the short time of the experience, there is no long-term repeated superposition, and thus a review cannot be completely equivalent to affection. There are two perspectives for studying tourism emotion at present. One perspective insists that tourism emotion is “the attitude experience of tourists who are satisfied with their travel demands”, and the other perspective believes that tourist emotion is the emotion and affection of tourists (Bigné, Andreu, & Gnoth, 2005; Zins, 2002). Combined with the above analysis, this article defines travel reviews as emotional expressions of the experience and attitude that tourists have after the superposition of different emotions generated by ongoing tourism activities, or after the activities.

The current psychological theory of emotion has two major school, namely, category and dimension. The category school insists that there are basic emotions and complex emotions. Basic emotions are innate and include six categories, such as happiness, sadness, anger, disgust, fear, and surprise. An analysis of emotions should proceed based on these six basic types. In the real world, these basic emotions will be superimposed and evolve, which leads to complex emotions (Ekman & Friesen, 1971). On the other hand, the dimension school considers emotions to be dependent on three vector dimensions, including valence, arousal, and strength, which are proposed and summarized as the pleasure, arousal, and dominance model (PAD Model). The assumption is that all kinds of human emotions are formed by these three dimensions to a different degree (Russell, 1980). The difference between these two schools lies in that the dimension school does not consider the basic types of emotions or the absolute classification criteria. In contrast, the category school is relatively easy to understand and more convenient to operate, but the specific classification of several categories has not yet been conclusive. Among the types of emotions defined by category orientation, there are many emotions that are highly correlated, such as anxiety and depression, which is also one of the reasons why this theory is currently questioned.

These theories have been initially applied in online text sentiment measurements; for example, the analysis logic of Linguistic Inquiry and Word Count (LIWC) is an application of the category orientation. LIWC software is currently the most mainstream online text emotion analysis
software, which can be used for sentiment measurement of massive texts, by means of word segmentation and part-of-speech matching, and which can capture more than ten emotions. The user can establish a specific emotion vocabulary for different research purposes, formulate a reasonable emotional superimposition logic, and then analyze the types of emotions contained in the text. This approach is more useful when dealing with massive amounts of unstructured data.

There are three kinds of emotion analysis techniques: natural language processing technology, machine learning technology, and word matching technology. Early research mostly used the natural language processing method. Word segmentation was performed manually or by a computer, and then the emotion of the text was analyzed (Pang & Lee, 2005). However, natural language processing is inefficient and requires a great deal of manual interpretation. As a result, machine learning and vocabulary matching are gradually becoming the mainstream approaches.

This paper aims to explore the evaluation method of destination satisfaction by using massive UGC data. The analysis logic is basically consistent with the LIWC, in which emotion types are predesigned, and then the word frequency is captured. Furthermore, we use machine learning and manual interpretation to analyze the emotions of tourists. Tourists’ emotions are first divided into three types, namely, positive, neutral and negative, and supplemented by manual content analysis to explore the emotional fluctuations of tourists.

2.3. Tourism events
The study of festivals from the perspective of tourism and sports events can be dated back to the 1960s (Catrice, 1961; Petrák, 1966). An event is defined as a short, comprehensive series of activities, and includes facilities, personnel, and management mix at the time of occurrence (Getz, 1997). Among these events, special events have nonrecurring characteristics and occur outside of people’s daily lives. A mega-event refers to an event that attracts a large number of tourists, with a wide range of impacts on urban transformation (Müller, 2015).

The impact of an event on a host city, especially economic impacts, social impacts, and the perceptions of tourists, have been widely discussed (Brannagan & Giulianotti, 2015; Olberding & Olberding, 2014). For example, it has been demonstrated that hosting Olympic Games increases the number of tourists, brings employment opportunities, and drives the development of related industries (Luo, 2003). Some scholars have also studied the impact of events on visitor perceptions and behavioral intentions (Kaplanidou, Jordan, Funk, & Rindinger, 2012). For instance, Jin, Lee, and Lee (2013) used the case of the IAAF World Championship to show that the quality of an event can significantly influence tourists’ behavioral intentions and that the destination image can also impact visitor behaviors via perceived value.

Studies have shown that an event will have an impact on tourist perceptions, but how events impact tourist perceptions at the microlevel is still unclear, especially in terms of the impact on tourists’ evaluations of a destination, which is almost impossible to find in the literature. Therefore, this paper regards tourist emotions as one aspect of tourist perceptions, takes into account that events will have an effect on tourist emotions and measures the intensity of tourist emotions by the quantitative method.

Based on the above studies, this paper decided to use UGC data to measure the impacts of tourism events on tourist evaluations of a destination. The next section introduces the methods used in this study.

3. Research methods

3.1. Analytical tools
Content analysis is an in-depth analysis of the content of the research object (Stepchenkova, Kirilenko, & Morrison, 2009). Analysis of the content can be carried out by means of computer tools.
and manual analysis. This paper analyzes the collected tourists reviews of Sanya with the help of Python programming, in order to calculate the score of positive and negative tourism emotions. The paper then defines the nature of the reviews by using the tourism emotion calculation rules developed by Liu’s group (Liu, Bao, & Zhu, 2017) and saves the scores for each day for later analysis. After the computer-assisted emotion analysis, a content analysis of the tourists’ reviews is applied. This study then performs a correlation analysis to examine the major impacts related to positive and negative sentiments with the IBM SPSS 22.0, which mainly aims to identify whether there is a dependency between the study objects, what kind of a dependency it is and to what degree.

3.2. Case selection

Sanya, the southernmost city on Hainan Island, is renowned for its tropical climate. The city is rich in marine resources, hydropower resources, and ecological resources, which means that it offers a wide variety of attractions and opportunities for tourism development. In recent years, in order to implement the Hainan International Tourism Island Policy in China, Sanya has organized a number of tourism events to construct its destination brand and promote its attractiveness in the tourism market. In addition to positive event effects, some negative effects of events also inevitably hit Sanya’s tourism market. For example, it was shown that the “rip-off event” in 2012 created a severe tourism crisis and prevented 71% of self-service tourists from traveling to Sanya (Luo, 2012).

Sanya’s tourism resources therefore provide opportunities for tourism events, and tourism events also have an impact on tourist behaviors and tourism development. The comprehensive examination of both positive and negative events, and how they affect the overall image of Sanya, is therefore the core aim of this research. By studying the emotional impact of tourism events on tourists, it aims to assess tourists’ evaluations of these events.

3.3. Data collection

This paper uses tourist online reviews to represent tourists’ electronic word-of-mouth (e-WOM.) This type of UGC is more structured than travel logs and has a large volume. The data were collected from five major websites in China: Baidu Travel, Mafengwo, Tripadvisor, Qunar, and Ctrip. All tourism destinations with more than 100 tourist reviews were collected by the web crawler software. Dating from September 1st, 2013, to August 31st, 2016, a total of 129,930 reviews were collected. All the reviews were gone with quick manual check to see whether there were fake reviews. 139 useless reviews were deleted including empty reviews, advertisements, wrong pasting and incomplete reviews. 129,791 reviews were eventually selected into the database for later analysis.

In terms of events, this paper searched internet for tourism events hosted in Sanya during the same period by using keywords such as “Sanya Event,” “Sanya Race,” or “Sanya special activity”. To ensure reliability, we only searched the events which had been listed or mentioned in the official website of the Sanya Tourism Bureau. After the selection, a total of 59 tourism events were included in the research.

3.4. The tourists’ emotional scores

The collected tourist reviews contained a great deal of emotional information. To develop a more in-depth understanding of the e-WOM, our research used the Tourist Sentiment Evaluation (TSE) Model, which was developed by academics from the Tourism Emotional Geography lab at Sun Yat-sen University in China. The TSE model calculates the emotional scores of a short text (e.g. a tourist review) based on Chinese grammatical rules and semantic logics (Liu et al., 2017; Liu, Huang, Bao, & Chen, 2019). The model then defines whether this review is a positive or a negative one according to the scores. To compare the emotional score with the influence of the tourism events, this study further calculates the average score of all the reviews posted on the same day. We thus
obtained the emotional score of a day by adding the positive scores and absolute values of the negative scores. The results are shown in Figure 2.

3.5. The tourism events
To quantify the impacts of the tourism events, this study applies qualitative and quantitative approaches. The former approach aims to identify the impacts of tourism events by manual reading, and the latter aims to quantify the values of the events from the tourism perspective. We establish the following evaluation criteria for tourism events, which try to measure the degree of the impacts of the tourism even:

1. Whether any event happened on that day; if not, the score is 0.
2. Positive and negative events were evaluated using a positive score (from 1 to 5) and a negative score (from $-1$ to $-5$), respectively. The rules used are as follows:
   - Whether tourists participated the event: tourist-participated > nontourist-participated
   - Scale of the event: international > national > province > city > tourist site
   - Event venue: outdoor > indoor
   - Years of holding the event: regular and consecutive > occasional
   - Media reports of the event: national media (CCTV, etc.) > regional media (news, etc.)
   - Damage related to the event: casualties > injuries > no injury
   - * Since the purpose is to evaluate the impact of the event on tourists, the first rule is the most important.
3. If more than one event happened in one day, the score of that day is the sum of the event scores.

Based on these criteria, every tourism event has a given a score, and then the score of the day is calculated based on the score of the events. The results are presented in Figure 3.

4. Results

4.1. Basic correlation analysis of event values and tourist emotions
Since the sum of the positive and negative emotion scores for a single day may counteract the emotional fluctuations, we introduced a concept of tourist emotion_abs, so is the event value. This research independently tests whether such factors matter. Based on an SPSS correlation analysis, this research explores the correlation among the variables below.
Daily event value: sum of positive and negative event scores of the day;

Daily event value abs: sum of positive event scores and the absolute value of negative event scores of the day;

Daily tourist emotion: sum of positive and negative tourist-emotional scores of the day;

Daily tourist emotion abs: sum of positive tourist-emotional scores and absolute value of negative tourist-emotional scores of the day;

Daily satisfaction: average scores of the starting rating scores given by reviewers;

Nature of reviews: positive, neutral or negative.

As Table 1 shows, the event value, the absolute value and the accumulated value, correlate with tourist emotion, but the relationship is very weak (0.068, sig < 0.05/0.083, sig < 0.01), even weaker than between the amount of reviews and tourist emotion. This observation implies that multiple events throughout the year have almost no direct impact on tourist emotion and e-WOM. This finding also shows that the number of reviews correlates with tourist satisfaction and with the nature of reviews, which means that the more reviews that are given on the internet, the more satisfied the tourists tend to be.

Greater satisfaction reflected by online star ratings is expected to draw more positive reviews of a destination. However, this research finds that the correlation between tourist emotion and satisfaction is positive, but weak (0.303, sig < 0.01/0.305, sig < 0.01). This finding echoes the arguments of Liu et al. (2017) that the star rating is not reliable because tourists often give a good rating while writing negative comments in the review.

4.2. The impact cycle

To gain a better understanding of event impacts, a manual interpretation was used, and we found that the nature, scale and impact of the 59 tourism events were different. Therefore, our study divided the tourism events into three categories in order to identify the impact of tourism events on tourist emotions and the impact cycle. The classification of these events is shown in Table 2.

4.2.1. Events of a single nature

After classifying the events, we can remove the events that have a single impact on tourist emotions and e-WOM. Such negative events, for instance, heavy rain and typhoon weather, made one tourist comment “we experienced typhoon when we got there, so disappointing.” In October 2014, CCTV and other media reported a series of customer rip-off incidents in Sanya. When Sanya’s public image was negative, tourists wrote reviews such as: “when speaking of Sanya, people’s first impression is the rip-off instead of beautiful island, arriving in a good mood but returning with disappointment.” In terms of positive events, tourists wrote reviews such as “romantic”, “worthwhile”, “memorable”, etc., to express their pleasure.
The events of a single nature can be further classified into two categories. The short-term impact events include Sanya Beach Music Festival, Typhoon, and so on, while the long-term impact events contain the rip-off incident, the Running Man China filming, and Round Hainan Regatta.

Tourist reviews of short-term impact events are generally posted on the internet within six months after the event. These events are always held at a fixed time, and tourists can participate and obtain enjoyment from them at this specific time. However, after a period of time, tourists no longer mention these events, which means the events no longer had an impact on tourist emotions.

“One has to come during one’s lifetime. The scenery is truly beautiful. We happened to find the annual wedding expo. It’s golden wedding this year, so are my parents, how lucky.”

- Tourists 2#31892, 2014-12-30, The remotest corners of the globe resort (Posted 3 days later)

Further analysis of the statistics related to short-term events shows that such events only influence a minority of tourists and that they have different impact cycles, as shown in Table 3. For instance, the impact cycle of the Sanya Beach Music Festival is only 3 days, while that of the Sanya Destination Wedding Expo is six months.

However, events with a long-term impact were mentioned by tourists even after 1–2 years. In these cases, these events have become the image of the destination more than individual events. For example, “Regatta” has become a label for Sanya. When tourists write reviews of the regatta, they often describe the Sanya regatta as “high-class” or as a “professional” regatta.

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**Table 1. Correlation analysis of events value and tourists’ emotion**

| Independent Variable | Daily tourist emotion | Daily tourist emotion_abs | Satisfaction | Nature of review |
|----------------------|-----------------------|---------------------------|--------------|-----------------|
| Daily event value    | .083**                | .056                      | .008         | .097**          |
| Daily event value_abs| .068*                 | .034                      | -.035        | .068*           |
| Number of reviews    | .168**                | .201**                    | .203*        | .186**          |
| Daily tourist emotion| -                     | -                         | .303**       | .618**          |
| Daily tourist emotion_abs| -                   | -                         | .305**       | -.031           |
| Satisfaction         | -                     | -                         | -            | .261*           |

**Table 2. Three classifications of the events**

| Classification standard | Events (Examples)                                                                 |
|------------------------|-----------------------------------------------------------------------------------|
| Events that cause positive or negative tourist emotion | Round Hainan Regatta, Running Man China filming, March 3rd Festival (Sanyuesan Festival), rip-off incident |
| Events that cause both positive and negative tourist emotion | Marathon, Hainan Rendez-Vous Party |
| Events that have no impact on tourist emotion | “HNA Cup” Bridge Tournament, Tour of Hainan, Hainan International Wine and Spirits Exhibition |
The water in Yalong Bay is the best in Sanya. Entertainment is strongly present with the yachts, regatta, sailing, and diving. Yalong Bay is also a free beach, next to the shower. The waves in Yalong Bay are larger than those of the East China Sea."

- Tourists 4#4330, 2014-03-23, Yalong Bay

4.2.2. Events with multiple effects

Some events have both positive and negative impacts on tourists. The marathon is the best example. The purpose of hosting a marathon is to attract tourists to participate, improve their physical fitness and enhance the city’s tourism influence. For example, a person may take a special trip from Yangzhou to Sanya to participate in the competition for cultural reasons, that is, to experience the Buddhist culture. However, some tourists were more concerned about the inconveniences caused by the marathon, such as road closures or fully booked hotels. The marathon has a positive influence on those involved, but might have a negative impact on nonparticipants. Relevant reviews were posted by tourists 3–5 days after the event, showing a short-term, but intense impact.

“I came to Hainan from Yangzhou, Jiangsu, to participate in the Sanya Marathon. As is known, since the Qing Dynasty, Sanya has been linked to Yangzhou for the monk Jianzhen. Monk Jianzhen’s eastern journey repeatedly failed. During the fifth sea crossing he encountered gales and waves, then drifted to Hainan Zhenzhou (now Sanya), and stayed there more than a year, repairing temples, preaching ... “

- Tourists 2#20557, 2016-03-03, Nanshan Cultural Tourist Zone

“We initially booked the Eadry Resort on Sanya Island, but due to the marathon on the 28th, the hotel was packaged by the team tourists. As a result, I could only book the Dadonghai Wutong Villa ... Even worse, road will be closed at tomorrow 9:00 a.m. My trip is already a dead duck ... “

- Tourists 1#3077, 2016-03-05, Dadonghai

Another event, the “Hainan Rendez-Vous” was viewed by tourists as “gossip about the rich”, but someone praised the venue, saying that “The MGM Hotel’s bar is pretty cool for fashionable young people. No wonder Hainan Rendez-Vous is held here” and that “Yalong Bay is the most exciting part of Sanya.” Visitors no longer seem to pay attention to the exhibition benefits, but rather to the environment and its negative social impact.
4.2.3. Events without impact on tourist emotions

The above analysis identified several non-impact events, classified on the basis of whether tourists mentioned the event or relevant activities. Such events included the “HNA Cup” Bridge Tournament, the Golf Tournament, and so on. The common characteristic of these events is low tourist participation. Although these competitions were held to promote Sanya’s popularity and were open to the public, they were held at a professional level, so that the participants were mainly professional athletes, and tourists were rarely involved in these events. As a result, they were not beneficial for e-WOM and destination branding.

5. Discussion

5.1. Tourist positivity bias

The tourist reviews show a typical Pollyanna effect in the expressed sentiment. The Pollyanna effect is defined as a universal human tendency for people to use positive evaluative words more frequently and more widely than negative words (Boucher & Osgood, 1969).

The above results show that the impact of event scores on tourist emotions is even weaker than the number of reviews; in other words, the greater the number of reviews is, the more positive the tourists seem to be. This observation indicates that the public may have a certain kind of “positivity bias” when reviewing the past, which is consistent with the Pollyanna archetype (Matlin & Stang, 1978). Hence, we should be too optimistic towards the e-WOM reflected by the tourist reviews.

In addition, the correlation between the satisfaction (average scoring of the start rating scores, which is awarded by reviewers) and the nature of the review is only 0.261**. Further analysis found that the average scores given by reviewers reach up to 4.27/5 in three years (the average scoring of 1–2 stars for 1 day; 3 stars for 91 days; 4–5 stars for 1,004 days). Given the nature of the reviews, however, the number of days with negative, neutral, and positive reviews, were 10, 195, and 891, respectively. Compared to the semantic analysis of sentences in the reviews, the star ratings are more likely to be caused by tourist positivity bias, resulting in overly optimistic ratings. Qiu, Lin, Leung, and Tov (2012) studied the emotional data published by people on Facebook based on the ratio of participants and self-descriptions. They found that the feelings expressed on Facebook are generally more positive than in real life. In general, public expression on social networks have a purpose. When an individual wants to gain the respect of others and to feel secure, he or she tends to express him/herself in a milder and more euphemistic way; that is, he or she uses more positive words and fewer negative words. In other words, tourists are more inclined to score higher and give positive reviews.

In contrast, the evaluation of events in this study is relatively objective. The negative events will have negative scores based on the nature and scale of the events, and the criteria of whether the tourists are involved, etc. The correlation between tourist emotional scores and event scores is therefore weak.

5.2. Types of events by impact

Of the total events, 59 events can be grouped into six types: Class I (Positive Long-term Impact Events), Class II (Positive Short-term Impact Events), Class III (Negative Short-term Impact Events), Class IV (Negative Long-term Impact Events), Class V (No Impact Events) and Class VI (Multiple Impact Events). Class I—IV events can be displayed on the axis (Figure 4). The results offer suggestions on how different types of events can be matched, in order to improve Sanya’s positive tourist image and to reduce the impact of negative events, further promoting a sustainable tourism development in Sanya.

Class I: Improve the e-WOM of the tourist site and enhance the image of the host city. The event will remind tourists of the city. We can therefore increase thematic activities and facilities associated with events at tourist sites. Since the filming of the Running Man has already highlighted the
Sanya Romance Park, some small video clips of movies can be added in the park to strengthen tourists’ impressions. For the regatta, the organizer can enhance the thematic experience, such as the Sailing Theme Restaurant, to encourage tourists to stay longer and spend more money. These projects can strengthen the relationship between events and tourist attractions and improve the image of the destination.

Class II: Visitors may travel to Sanya because of these events, or occasionally participate in these events with increasing satisfaction. Therefore, before such events occur, we can increase the intensity of publicity and disseminate relevant information through various media channels, making the event widely known. After the event, we can continue to expand its impact by establishing a connection between the scenic spots and events to make it one of the hallmarks of the tourism destinations. By prolonging the impact of such events, it can be transformed into a Class I event, or be aligned with a Class I event.

Class III: Reduce regrets and provide alternative activities. Extreme weather events cannot be avoided, but appropriate preventive measures can be taken. When bad weather makes outdoor activities impossible, we can increase the diversity of indoor activities to minimize the tourists’ regret.

Class IV: Improve the public management during the crisis and prevent the recurrence of such events. When such negative events occur, the Sanya authorities should carry out active public relations management to cope with the crisis and reduce the negative impact of the event on tourism. To fundamentally solve this problem, the government needs to strengthen legislation, take proper supervision of the tourism market, and severely punish cheating merchants.

Some events did not have an impact as we predicted. First, almost all the sport competitions did not attract tourists, except the regatta. This observation may be due to the facts that these events are open to professionals and that sightseeing tourists rarely participate. In addition, visitors who leave reviews on the review site generally purchase travel products (such as scenic spot tickets, bus tickets, hotel bookings) on these sites, and competitions events are often not sold on these sites, so visitors may not be able to participate in events. Furthermore, for some negative impact events, some tourists would cancel their trips to Sanya, but this kind of impact could not be reflected in the travel reviews because tourists do not visit Sanya.

6. Conclusion
By using big data methods and a correlation analysis, this study innovatively examines the impacts of tourism events on a destination’s word-of-mouth, as reflected in tourist reviews in Sanya, China. The research highlights two main findings. First, the majority of the events did not significantly or directly affect tourists’ emotions, so there is no solid evidence to support the claim that Sanya’s
tourism-related events have a significant impact on its destination branding. In contrast to previous studies, this finding is likely to disappoint the organizers of pro-tourism events. Second, although there are no strong positive impacts, tourism-related events did have some specific impacts on destination branding. In the short term, that is fewer than six months, culture-related events were effective in improving the destination’s image, while natural disasters clearly had negative impacts. In the long term, that is, from six months to two years, sports-related events had positive impacts, while negative impacts were largely the result of tourist rip-off incidents. A few of these long-term elements have become a part of Sanya’s destination image.

In conclusion, this paper argues that hosting tourism events would not be a sustainable way of destination branding, according to direct or indirect economic outputs, unless there are other non-economic interests. This study’s contribution lies in two folds. In theory, it proves that the effects of hosting tourism events is controversy and thus offering a critical evidence against the advocacy of host tourism events for destination branding. In practice, this paper provides a fast and lively method for measuring event impacts. The classification of tourism events by impact type sheds light on the diversity of pro-tourism events and can help organizers optimize their destination branding strategies.

There are some limitations to this study. First, the data-cleaning job can be improved. Some tourist review texts can be repeated. Some of the reviews may not be original, and the authenticity and reliability of copy-paste reviews is difficult to establish. In addition, intermittent events and other factors caused by emotional fluctuations may influence the results. Since an event occurs only at a certain period of time, some days have an event score of “0”. From the tourist perspective, the reasons for their the emotional fluctuations are not only the “events” but also other factors, which are not discussed in this paper. Finally, the positivity bias cannot be ignored. As mentioned above, tourists tend to write positive reviews. Even if a negative event occurs, the emotional score of the day can still be positive, so it is difficult to measure the real influence of a negative event on tourist emotions. These are existing challenges that need to be approached in future studies.

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