Investigating the appeal of a visitor guide: a triangulated approach

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Abstract

Purpose – Destination management organizations deliver travel-related information through visitor guides to build destination awareness and attract potential tourists. Therefore, this research aims to investigate how people read such a guide, understand their attitudes and to provide recommendations on enhancing its design.

Design/methodology/approach – This research used eye-tracking technology in tandem with surveys and in-depth interviews. Eye-tracking technology uncovered the elements of a visitor guide that attracted particular attention, whereas surveys and interviews provided deeper insights into people's attitudes toward them.

Findings – People do not spend attention equally on each page of a visitor guide. Instead, they look at the reference points (i.e. photo credits, photos, headings and bolded words) and then read the adjacent areas if the information triggers their interest. The characteristics of the attractive components of a visitor guide were discussed and suggestions on designing a more appealing guide were provided.

Research limitations/implications – The triangulated approach not only generated objective and insightful results but also enhanced research validity. This exploratory sequential mixed method can usefully be applied to test other stimuli and assess attention.

Practical implications – To be deemed appealing, a visitor guide should avoid ads unrelated to the destination, include more photos, use the list format and bolded words, add stories or selected comments from social media and provide well-designed maps.

Originality/value – This research fills a gap in the literature by using a triangulated approach including eye-tracking, survey and interviews to examine a 68-page visitor guide. The concept of reference-point reading behavior is proposed. Practical implications are discussed to improve the design of a visitor guide.

Keywords Survey, Interview, Eye-tracking, Triangulated approach, Visitor guide

Paper type Research paper

Introduction

Visitor guides have been shown to increase the level of interest in a destination. Drawing on research by Destination Analysts and Longwoods International, Adams (2017) demonstrated that visitor guides and other print materials are used by a record 54 per cent of US travelers in planning a trip, with 22 per cent specifically using official travel guides. Indeed, two-thirds of destination management organization (DMO) guide readers have visited the destination depicted. The guide's compelling content is an active way to inform people about the benefits of traveling to a specific locale (Min *et al.*, 2013), and to create a

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first impression in people's minds (Fakeye and Crompton, 1991). Therefore, DMOs have treated visitor guides as an important way to provide general information and promote specific attractions (Wicks and Schuett, 1991) as well as form a good destination image and attract potential tourists (Chen *et al.*, 2014). The impact of a visitor guide on visit intention depends on readers' perceived usefulness of the guide and prior experience. Readers who have more positive evaluations of a visitor guide are more likely to visit the destination (Andereck, 2005). The important role of the design of a visitor guide is prominent, but the very limited research to date has only examined consumers' perception of the front covers of brochures (Gilbert and Houghton, 1991), the distribution mechanisms and use of travel brochures (Wicks and Schuett, 1991), the relationship between tourist evaluations of a brochure and visit intention (Andereck, 2005), readers' perceived skepticism and message persuasiveness (Rozier-Rich and Santos, 2011) and readership typologies (Lever *et al.*, 2019). Left unaddressed in the literature is how tourists navigate a visitor guide, what aspects capture their attention and the reasons for their behavior. The inadequate research may pose obstacles in designing an appealing visitor guide and impair its promotional effectiveness.

Surveys and interviews are often used by researchers to examine how people evaluate a tourist brochure (Andereck, 2005; Gilbert and Houghton, 1991), but self-reported data pose issues such as inaccurate recall, response bias, misinterpretation and validity issues (Dolnicar, 2018; Zhang *et al.*, 2004). Therefore, researchers in marketing have adopted an eye-tracking technique to measure people's eye movements and diagnose promotional materials (Lee and Ahn, 2012) as it captures real-time and objective data. However, its application in the tourism context is still limited (Li *et al.*, 2016; Scott *et al.*, 2016; Wang *et al.*, 2018; Wang and Sparks, 2016; Lever *et al.*, 2019). This study adopted the eye-tracking technique to assess the attractive components of a visitor guide and generate insights into people's visual behaviors, which refer to people's eye movements and their patterns when viewing a specific object (Gong and Buxton, 2002). Although eye-trackers can record objective data, they also present some limitations in terms of data interpretation or providing information about the reasons for what captures people's attention. Mayr *et al.* (2009, p. 198) argue that "interpretations of eye-tracking data [. . .] are often based on assumptions and heuristics about underlying cognitive processes." Therefore, this study used a triangulated approach that includes eye-tracking, surveys and in-depth interviews to investigate how 22 university students from 11 different countries read and evaluate the printed Ottawa Visitor Guide. It not only captures people's visual behaviors but also offers insightful explanations as to what does and does not capture their attention as well as why this is so.

Literature review

Theory of selective attention

Attention is an important factor in advertising effectiveness, but because humans have limited mental capacity, they allocate visual attention to the aspects of greatest interest while ignoring those of little interest (Carrasco, 2011; Garner, 1978; Gong and Buxton, 2002; Nelson, 1999). Increased visual attention requires people to make a greater cognitive effort to process the information (Rozier-Rich and Santos, 2011), and when they do so in the case of advertising, this can lead to a higher likelihood of purchasing the item (Fox *et al.*, 1998). When people's eyes fixate on an element of information within a scene, they take time to read and process the information, and thus fixation time has a positive relationship with their attention and cognitive efforts (Hutton and Nolte, 2011). Therefore, understanding what information attracts more visual attention is critical to enhance marketing effectiveness (Chiou *et al.*, 2008). Because eye movement is an indicator of one's attention and cognitive processing (Fox *et al.*, 1998; Just and Carpenter, 1980), researchers have

adopted eye-tracking technology to record people's eye movements and to provide implications on the design of marketing materials (Berto *et al.*, 2008; Scott *et al.*, 2016; Smit *et al.*, 2015; Thomsen and Fulton, 2007). An eye-tracker records eye movement by projecting near-infrared light to create reflections on the pupil and cornea and capturing the image of the eye showing these reflections. A sophisticated algorithm is used to estimate the position of the eye in space and to determine the specific place at which a person looks (Tobii Studio User's Manual, n.d.). There are three main benefits of using eye-tracking technology. First, compared to the traditional approaches (e.g. surveys and interviews), an eye-tracker is a more effective tool to understand people's relative attention and scene perception because it can measure participants' actual visual behaviors instead of their memory of the process (Burns *et al.*, 1993; Rayner *et al.*, 2001). It is especially useful for assessing the effectiveness of multiple pages of printed materials, such as visitor guides, menus and flyers (Wang and Sparks, 2016). The large amount of information decreases the reliability of people's memory of what they looked at, so using an eye-tracker can adequately compensate for the drawbacks of self-reported data in the methodological perspective. Second, eye-tracking can be conducted with surveys and interviews to enable the triangulation between physiological and self-reported data (Scott *et al.*, 2016). Third, participants cannot easily manipulate their eye movement data, and thus these data are more reliable than self-reports (Duchowski, 2003; Smit *et al.*, 2015). The unique role of eye-tracking is thus irreplaceable for research on selective attention.

To measure people's eye movements, four categories of data are often recorded: fixation counts (what elements attract people's attention), fixation duration (how long they pay attention to it), fixation point order (what object attracts attention first) and patterns of saccades (the amount of space they view) (Smit *et al.*, 2015; Wang and Sparks, 2016). In addition to these data, researchers also use surveys and/or interviews to better explain the relationship between relative attention and other constructs (e.g. advertising effectiveness, behavioral intentions, etc.). The use of surveys has been criticized for leading participants to think in a predetermined way (Govers *et al.*, 2007), whereas incorporating interviews has been deemed crucial because it can help to reduce one of the limitations of using eye-tracking: The data generated cannot indicate participants' purposes for fixating on a specific area, so a follow-up interview gives in-depth and insightful explanations (Mariussen *et al.*, 2014; Pan *et al.*, 2013).

Studies have investigated visual attention paid to different stimuli in the advertising context, such as fixations on ad, brand, pictures and text within the first five seconds of viewing or the use of color, page placement and the amount of text (Smit *et al.*, 2015). These characteristics are helpful in the design and development of more effective ads. Big ads in multiple colors are preferred. An article near ads should be in a single color, but not in red (Smit *et al.*, 2015). The color leads people to pay more attention to the context and less to the ads. Previous studies also examined people's eye fixation on certain information, like responsibility or moderation messages in the ads for alcoholic beverages (Thomsen and Fulton, 2007). It shows that people have better recall performance when they have more fixation counts and a longer fixation duration (Thomsen and Fulton, 2007; Zhou, 2012). This supports the importance of relative attention because more attention results in better recall.

Eye-tracking in tourism and hospitality research

Eye-tracking studies in tourism and hospitality are relatively new with the majority of research articles published since 2011 (Table I). Researchers are expressing interest in gaze point tracking to investigate tourism marketing effectiveness, menu reading, website usage

Sample, stimuli and authors	Methods	Results and findings
Topic: ads or photographs		
Sample: 25 university students Nonlinear stimuli: Two A4 magazine ads Authors: Scott *et al.* (2016)	Step 1: Eye-tracking: saccades, fixation durations, scan paths and heat maps Step 2: Surveys: a within-subjects ANOVA was adopted to compare self-reported scores for two ads	The block ad was better at attracting and holding attention compared to the text ad. Participants preferred block ads
Sample: 12 male and 18 female university students including 15 Australians and 15 Chinese Linear stimuli: 16 tourism photos Time: 12 seconds per image Authors: Wang and Sparks (2016)	Step 1: Eye-tracking: saccades, fixation counts and fixation durations Step 2: Surveys: a mixed-design ANOVA was used to compare self-reported scores for 16 photos	Australian and Chinese processed pictorial images differently. Image selection should consider the visual processing behavior of the target market
Sample: 17 male and 15 female Chinese students Nonlinear stimuli: 24 tourism photographs under four experimental conditions Authors: Li *et al.* (2016)	Step 1: Eye-tracking: fixation counts, total viewing time and heat maps Step 2: Surveys: a multivariate analysis of variance (MANOVA) was adopted to compare perceived advertising effectiveness	People paid attention to text within the landscapes of tourism photos regardless of whether they could understand the language of the text. However, the text in a known language held a longer attention and had higher perceived advertising effectiveness
Sample: 64 male and 49 female adults Nonlinear stimuli: nature-based or built-based servicescape with performance arts Authors: Wang *et al.* (2018)	Step 1: Eye-tracking: fixation counts and fixation durations Step 2: Surveys: a *t*-test was used to compare behavioral intentions	Nature-based servicescapes were more attractive than built-based servicescapes and triggered consumers' visit intentions. Performing arts activities in nature-based servicescapes attracted more attention
Topic: menus		
Sample: 25 faculty, graduates and undergraduates Nonlinear stimuli: one dinner menu and two wine lists Author: Yang (2012)	Eye-tracking: fixation durations and fixation sequence. An optimal matching analysis was conducted using standardized Levenshtein distances	The upper left corner of the first page attracted people's attention first. The bottom area of a menu held fewer fixations than other areas. People tended to end where the relevant information ended, which was similar to a book-reading pattern
Sample: 43 male and 52 female university students in three conditions Nonlinear stimuli: three conditions of menu labeling Authors: Kim *et al.* (2018)	Eye-tracking: fixation counts and fixation durations	Participants preferred physical activity-based formats over numeric or color-coded labeling. Physical activity-based formats were the most effective format for inducing healthy choices
Sample: 40 female and 40 male graduate and undergraduate students	Step 1: Eye-tracking: visit durations, visit counts and percentage of menu items	The effects of calorie disclosure and color-coding treatments were relatively equal

(*continued*)

Table I.
Examples of eye-tracking studies in the tourism and hospitality context

Sample, stimuli and authors	Methods	Results and findings
Non-linear stimuli: Calories menus with color-coding Authors: Schwebler *et al.* (2018)	Step 2 Surveys: A *t*-test was used to analyze the impacts of gender, hunger level, dining frequency, calorie consciousness, and calorie estimate accuracy	
Topic: webpages		
Sample: four male and five female university students Nonlinear stimuli: travel websites Authors: Mariussen *et al.* (2014)	Step 1: Eye-tracking: fixation durations and fixation counts Step 2: Surveys: survey questions about the importance of online information sources Step 3: Interviews: interview questions about the importance of online information sources	Travel agents' and marketplace's referrals and search engines were identified as the most crucial online information sources. Organic sources and induced online sources played an important role in the formation of destination image
Sample: five male and seven female international graduate students from a European university Nonlinear stimuli: 13 US destination online pages Authors: Marchiori and Cantoni (2015)	Eye-tracking: this study compared the results of eye-tracking study and a previous study that used self-reported data	Potential biases in data interpretation exist if only eye-tracking or self-reported data are used
Sample: 16 faculty and staff members of a university Nonlinear stimuli: four sets of hotel sites: 5 hotels with images; 5 hotels with text description only; 20 hotels with images; 20 hotels with text description only Authors: Pan *et al.* (2013)	Step 1: Eye-tracking: a two-way repeated ANOVA was used to test whether the number of options and the presence of images influenced the percentages of hotels viewed Step 2: Interviews: interviews were used to probe visual appeal	The number of hotel options in a choice set significantly influenced people's evaluation of the options. Hotels with low price and positioning at the top of the webpage received more attention
Sample: 13 male and 7 female Chinese students Linear stimuli: six hotel webpages were viewed with an eye-tracker Time: 10 seconds per webpage Authors: Hao *et al.* (2015)	Step 1: Eye-tracking: fixation durations and heat maps Step 2: Surveys: participants were asked to rate the appeal of hotel webpages Step 3: Interviews: interviews were used to explore the reasons for the ratings	Webpages of hotel websites with large main pictures and little text were more attractive to Chinese Generation Y
Sample: 21 participants Nonlinear stimuli: Vancouver 2010 website Authors: Green *et al.* (2011)	Step 1: Eye-tracking: time to first fixation, fixation counts and fixation durations Step 2: Surveys: participants evaluated the appeal of the website	The important features included size, placement and active links. Women and experienced online shoppers were less likely to be distracted from the shopping task
Sample: 15 male and 15 female Chinese students Linear stimuli: Seven web advertisements	Step 1 Eye-tracking: An ANOVA was used to compare saccades, fixation durations, and fixation counts.	Ads containing both text and price attracted greater attention, but the ads containing images and price without text held less

(*continued*)

Table I.

Sample, stimuli and authors	Methods	Results and findings
Time: 20 seconds per ad Authors: Kong *et al.* (2018)	Step 2 Surveys: Participants were asked about ad recall. The impacts of gender, tasks, and experience with online tourism websites on visual attention and memory were tested	people's attention and led to poor ad recall. The ads including image, text, and price had the best ad recall. Gender, task and experience were influential factors
Sample: 13 males and 19 females Nonlinear stimuli: search and view of hotel website Authors: Noone and Robson (2014)	Step 1: Eye-tracking: a descriptive analysis was adopted to analyze AOIs and fixation durations Step 2: Surveys: the importance of information was evaluated	Participants fixated mainly on firm-supplied information (user ratings, prices, locations, images and hotel names). Images were more attractive
Sample: 41 faculty and staff members of a university Nonlinear stimuli: the website of online travel agencies Authors: Pan *et al.* (2011)	Step 1: Eye-tracking: navigational paths and heat maps Step 2: Surveys: participants' verbal protocols were analyzed	When participants searched for information on the websites of online travel agencies, they were utilitarian in nature, so they tended to ignore complex interface and advertising messages
Sample: 30 males and 30 females Linear stimuli: three eTourism 2.0 tools and banner designs in six experimental conditions Time: 90 seconds per page Authors: Hernández-Méndez and Muñoz-Leiva (2015)	Step 1: Eye-tracking: a within-group *t*-test was adopted to compare fixation durations and fixation counts Step 2: Surveys: questionnaires were used to collect demographic information and behavioral variables (e.g. experience with eTourism 2.0 tools)	People had longer and prior attention to the text compared to the image. There were no significant differences between fixation duration on the static and animated banner, but people fixated first on the static banner. Age was an influencing factor of reading behavior
Topic: museums, cities and landscapes		
Sample: four experts and four novices in each museum Nonlinear stimuli: LiMo "Nexus" Exhibition and Linden-Museum Stuttgart "Pacific Oasis" Exhibition Authors: Eghbal-Azar and Widlok (2013)	Eye-tracking: participants were asked to watch their own processed eye-tracking videos and explain their goals of attention	The potentials and limitations of mobile eye tracking in visitor studies and other social science research were discussed
Sample: six males and six females Nonlinear stimuli: City panorama Authors: Kiefer *et al.* (2014)	Eye-tracking: correlation between total exploration field and exploration duration; between a total number of visited AOIs and exploration duration; and between exploration duration and number of AOI revisits were examined	The number of AOI revisited during a short period was a good predictor for the total exploration duration
Sample: 11 males and 25 females Nonlinear stimuli: three different landscapes Author: Potocka (2013)	Step 1: Eye-tracking: a heat map and a gaze plot Step 2: Surveys: participants were asked open-ended questions, and the results were analyzed through content analysis	Gaze plots and heat maps showed what attracts people's attention. People generally prefer natural landscapes which are harmonious and diverse with vegetation

Table I.

and visitor experience. It has been shown that a block tourism magazine ad is more attractive and maintains attention longer compared to a text ad (Scott *et al.*, 2016). Wang and Sparks (2016) found that Australians spent longer time on processing pictorial images than Chinese who are particularly attracted to the images of high-arousal activities in a natural environment, such as bungee jumping, whale watching and surfing. On the contrary, Australians pay similar attention to both low- and high-arousal activities portrayed in images. These and other findings are critical for improving the effectiveness of destination marketing.

In terms of the methodology, previous research commonly used eye-tracking techniques associated with surveys and/or interviews, and ANOVA to identify differences between two conditions (Huddleston *et al.*, 2013; Thomsen and Fulton, 2007; Zhou, 2012). However, there are three main limitations in previous eye-tracking studies in the tourism context. First, most eye-tracking studies testing marketing effectiveness analyzed linear stimuli where all participants see the same information (e.g. a photo and a page of an ad) within the same amount of time (Hernández-Méndez and Muñoz-Leiva, 2015; Kong *et al.*, 2018; Wang and Sparks, 2016). This type of research design enables researchers to use a timeline to code and analyze eye-tracking data, but this may not reflect participants' natural behavior. Therefore, allowing people to read or look at stimuli without a specific time limitation could better reveal their visual processing behavior. Second, the combination of text, ads and pictures are seldom explored (Li *et al.*, 2016; Scott *et al.*, 2016; Wang and Sparks, 2016), yet this type of research could be insightful, particularly for destinations, and the necessary combination metrics are an important topic in eye-tracking research (Smit *et al.*, 2015). Third, most previous research used surveys along with the eye-tracking technique, but researchers are not able to adequately explain the reasons for people's attention through surveys. Therefore, interviews, which allow participants to freely express their opinions and offer comprehensive understanding of a phenomenon, were adopted by some researchers to overcome the limitation of using only eye-tracking and surveys (Hao *et al.*, 2015; Mariussen *et al.*, 2014). This triangulated approach allowed researchers to better investigate the design of hotel webpages (Hao *et al.*, 2015) and explore the pre-trip destination image formation process (Mariussen *et al.*, 2014). However, no known studies have evaluated the design of a visitor guide using this triangulated approach. Surveys and interviews have been the dominant methods to assess a brochure (Andereck, 2005; Lester and Scarles, 2013), but they present some serious shortcomings. As a visitor guide often contains more than 30 pages, it is difficult for participants to recall all the components that attracted their attention. Additionally, the self-reported data have response bias, misinterpretation and validity issues (Dolnicar, 2018). Solely using eye-tracking to assess a visitor guide is also a suboptimal approach because eye movement data do not provide behavioral explanations. The triangulated approach allows researchers to cross-verify results from physiological (i.e. eye movements) and self-reported (i.e. surveys and interviews) data, resulting in more valid and insightful findings. Therefore, this research adopted the triangulated approach and adjusted its process for investigating brochure design. Rather than planning a trip using online resources, the current study provided a physical visitor guide and, without placing any time constraint on participants, allowed them to peruse the whole *Ottawa Visitor Guide 2017/18* as they wished. This approach is useful to identify what information is more attractive and to understand people's attitudes.

Some researchers also asked participants to watch their own processed eye-tracking videos and to recall what drew their attention (Eghbal-Azar and Widlok, 2013). This type of cued retrospective reporting provides a better interpretation of participants' eye movements. Therefore, this research also adopted retrospective reporting where participants were shown

their eye-tracking videos and asked to explain why they spent more time on reading a specific area or why they ignored others.

To fill the literature gap and determine implications for practitioners on designing an appealing visitor guide, four research questions were proposed:

RQ1. How do readers browse a visitor guide when they plan a trip?

RQ2. What are the characteristics of the attractive components of a visitor guide?

RQ3. What are people's attitudes toward the different components (i.e. ads, photos and photo credits, text content and maps)?

RQ4. How can the design of a visitor guide be improved based on the results of eye-tracking, survey and interviews?

Methodology

Research design

This study chose the 2017/2018 edition of the visitor guide of Canada's capital city Ottawa available both online and at the local and provincial Travel Information Centers. This city topped the list for tourism increases in 2017 with a growth rate of 5.5 per cent, and the number of overnight visitors increased to 5.37 million (Kovessy, 2017). It is highly accessible to a wide range of unique visitors. The visitor guide has 68 pages including front and back covers and contains various types of information, such as a calendar of events, introduction of tourist spots, listings, ads, maps and general information, which covers the key components of a visitor guide (Wicks and Schuett, 1991). Many other visitor guides have similar types of information, so this particular guide can act as a proxy with results providing implications for their design in general. The rich information also fits the objective of this study well.

This study invited university students to participate in the research. Students are generally the participants in the vast majority of eye-tracking studies because the research tends to be exploratory in nature (Table I). Screening questions were used to eliminate any participants who might have adverse effects from the use of the eye-tracking equipment. The participants were students who had not been to Ottawa and who were interested in reading printed visitor guides. Participants were asked to read the guide in the researcher's office, which was a controlled environment. Data were collected between August and September in 2017 from 22 students at which point no new information was found from interviews, indicating data saturation (Table II). This sample size was in line with previous eye-tracking studies (Table I), most of which recruited 15-30 participants.

Step 1: eye-tracking. The Tobii Pro Glasses 2 wearable eye-tracker was used to gauge and record participants' eye movements. Researchers first let the participants read another printed visitor guide for one minute to help them get used to reading with an eye-tracker. Participants were then asked to plan a two-day trip by referring to the print version of *Ottawa Visitor Guide 2017/18* while wearing the eye-tracker. In most previous studies, participants were asked to read stimuli without any tasks, but this makes it difficult to distinguish between level of interest and sheer amount of information. Therefore, it is important to set some specific tasks. The participants were free to choose how long they perused the visitor guide and in which order they wished to read it. The goal was to let participants explore the visitor guide in a natural way. Two researchers observed the participants' eye movements on the Tobii tablet device in the office next to the one where the participants read the visitor guide with the eye-tracker. The researchers wrote notes

No.	Gender	Age	Origin	Total reading time (s)	Categories
19	Male	23	Canada (Toronto)	306.16	Skimmer
3	Female	20	USA (Vermont)	543.76	(less than 15 minutes)
20	Male	32	South Korea (Seoul)	636.98	
22	Female	20	China (Fujian)	661.42	
17	Male	35	India (New Delhi)	774.59	
5	Female	30	China (Fujian)	918.78	Scanner
7	Female	20	Canada (Guelph)	969.97	(15-20 minutes)
18	Male	30	USA (Chicago)	1050.13	
9	Female	31	Brazil (Curitiba)	1057.40	
4	Female	28	Mongolia (Ulaanbaatar)	1137.13	
8	Female	22	Canada (Markham)	1174.81	
21	Female	34	Canada (Guelph)	1180.37	
16	Female	20	Canada (London)	1349.70	Intensive reader
10	Female	18	Costa Rica (San José)	1455.35	(more than 20 minutes)
6	Female	21	Canada (St. John's)	1471.63	
12	Female	24	China (Shanghai)	1499.56	
1	Male	19	Vietnam (Hanoi)	1572.28	
11	Male	31	China (Beijing)	1609.66	
13	Female	18	Canada (Vancouver)	1683.58	
15	Male	27	Bangladesh (Dhaka)	1686.26	
2	Male	29	Canada (Toronto)	1753.20	
14	Male	28	Pakistan (Islamabad)	1950.95	

Table II. Demographic information of participants

about what content in the visitor guide attracted participants' attention (e.g. ads, photos and words) and the time that the stimuli appeared. Both then cross-checked their notes to discuss the components that most captured a participant's attention, and these were then probed in the in-depth interviews. Even though the eye-tracker can collect detailed and objective data about people's eye movements, analyzing these in the Tobii Pro Lab software is very time-consuming, making it difficult to complete immediately after participants finish reading the stimuli. Therefore, allowing two researchers to observe participants' eye movements on the Tobii tablet device and taking notes was deemed the most feasible approach for revealing the attractive components on site.

Step 2: survey. After participants finished the task, they were presented with a survey questionnaire. The full survey included 14 statements, and participants were asked to indicate their agreement levels within the statements using a five-point scale (from 1 = strongly disagree to 5 = strongly agree). In addition to the five survey questions asked in Andereck's (2005) tourist brochure study, this research examined people's attitudes toward different sections of a visitor guide (e.g. text content, advertisements, maps and the list), as well as their opinions of Google Map and online travel information (e.g. *TripAdvisor*, *Zicasso*). As browsing online reviews before a trip becomes more prevalent, it is important to understand how people think about the information provided online and in an official visitor guide. The 14 statements are as follows: "The brochure helped me in planning my trip", "It is easy for me to find the location of the destination that I would like to visit", "I know how to get to the destinations (e.g. bus or walk)", "I need Google Map to find the location of the destinations", "Other online reviews (e.g. TripAdvisor, Zicasso) are more informative", "I trust the information of online reviews (e.g. TripAdvisor, Zicasso)", "I trust the information delivered in the visitor guide", "I like to read text in the visitor guide", "I like to read advertisements in the Ottawa Visitor Guide", "The map at the end is helpful in planning a trip", "The list at the end is helpful in planning a trip", "It would be more enjoyable if the

Ottawa Visitor Guide could be designed better", "I have a different perception of Ottawa after I read this Visitor Guide" and "The brochure increased my intention to visit Ottawa". This research paper focuses on the first 12 survey questions.

The survey stage enabled researchers to understand people's overall evaluation of the performance of this visitor guide, their opinions of online information and official visitor guides, as well as their attitude toward different components of the guide. Furthermore, these questions also worked as helpful guidelines for the in-depth interviews.

Step 3: in-depth interview

The quantified data offered an overall attitude of the participants, while the in-depth interview questions probed participants' eye movements and survey responses. First, participants were asked two general questions:

Q1. Why did they read the visitor guide in a particular way? (e.g. skipping some pages, reading in a sequential order)

Q2. What information did they remember from the visitor guide?

Then, participants were shown some clips of their eye-tracking videos recording the parts that they fixated on and asked to explain why they spent more time on reading a specific area and ignored others. Finally, they were invited to explain why they rated each statement as they did. Each interview lasted about 30 minutes.

The triangulated approach (Figure I) not only generated objective and insightful results but also enhanced research validity. This exploratory sequential mixed method can be also applied to test other stimuli and assess attention.

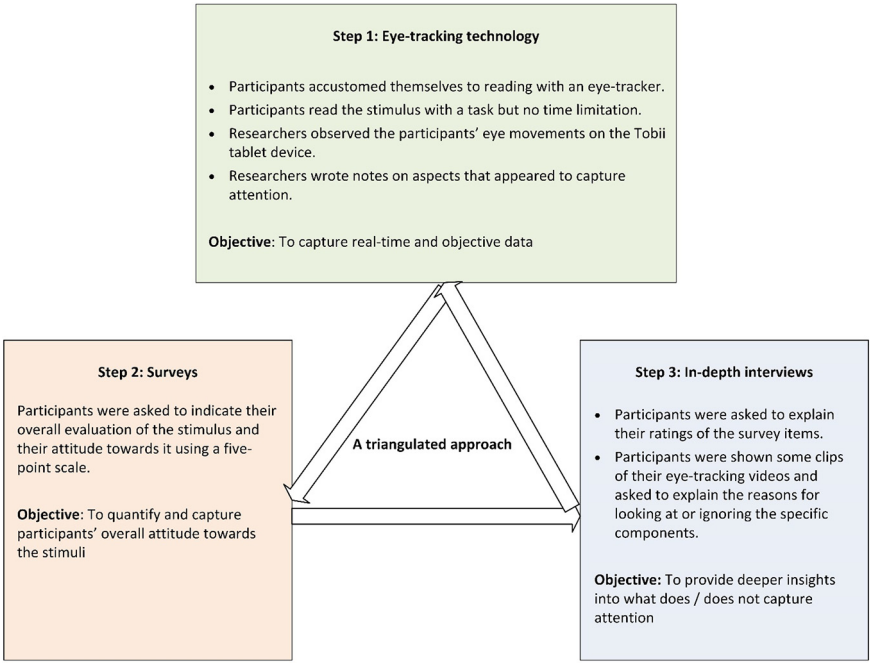


Figure 1.
A triangulated approach

Data analysis

The eye-tracking data were analyzed with the Tobii Pro Lab software. Two researchers coded the information on each page into the three areas of interest (AOIs): ads; photos and photo credits; and text content. These AOIs are useful for identifying which components of the visitor guide are appealing to readers. The Tobii Pro software calculated participants' eye fixation durations within each AOI and the time to first fixation on it, as well as created heat maps based on fixation durations. The fixation duration measures the length for all fixations within an AOI, an indication of how long an AOI holds people's attention. The time to first fixation shows the sequence of participants' eye movements. Heat maps visually demonstrate how long a certain area holds people's attention using different colors.

This study analyzed all 68 pages of the *Ottawa Visitor Guide 2017/18* for fixation duration, time to first fixation on each AOI and heat maps. Additionally, participants were asked questions about their opinion and suggestions on each section in the survey and interviews. Descriptive analysis of the survey was used and results were linked to participants' answers in interviews. Interview transcripts were analyzed in NVivo Pro. The interviews gave insights into what information attracted participants' attention, how participants evaluated the visitor guide and how to improve the visitor guide design from their perspectives.

Results

Demographic information

In total, 13 participants were female and nine were male with age ranges from 18 to 35, and a mean age of 25. The participants came from 11 different countries: Canada, the USA, South Korea, India, Brazil, Mongolia, Costa Rica, Vietnam, China, Bangladesh and Pakistan (Table II). All are fluent in English and the diverse cultural backgrounds provide broader perspectives and opinions. Because 22 participants spent different amounts of time on reading the whole visitor guide, they were categorized into three groups based on distinctive characteristics of each group. Previous literature named readers who spend fewer, medium and longer time on reading as skimmers, scanners and intensive readers, respectively (Brenna, 2012; Lawrence, 2015). As 15 and 20 minutes are thresholds for concentration while reading (Nowak, 2013), the participants in this research were categorized as follows: skimmers (SKs) looked at the whole visitor guide less than 15 minutes; scanners (SCs) spent between 15 and 20 minutes reading; intensive readers (IRs) read the visitor guide more thoroughly and spent more than 20 minutes (Table II).

Reference-point reading behavior

The eye-tracking videos demonstrated how people read the visitor guide and provided answers for the first research question. Three groups of readers spent different times perusing the guide, but they all flipped through the whole brochure from the front cover to the end with a sequence of viewing left page and then right page. Surprisingly, half of the participants did not look at the back cover at all. They expressed that the inside content was more important, so they did not flip over to the back. This finding is contradictory with marketers' practices as an ad on the back cover is normally more expensive than placing it on inside pages. Marketers tend to assume that the back cover of a magazine would attract more attention as it is exposed to the outside and has 50 per cent chance to be placed or tossed face down on a table or couch (Bruce, 2016). However, the back cover of a visitor guide may not be as visible as that of a magazine. As the participants explained, they were interested in acquiring travel information, so they would spend more time reading the inside content and might just ignore the back cover. Also, visitor guides are often placed with

the front cover facing out on a shelf in an information center which reduces exposure to the back cover.

SKs skipped more content than either SCs or IRs. When SKs found the content was not of interest to them, they would skip the whole section very quickly. They explained that because reading a visitor guide is different from reading a textbook, they just wanted to find some interesting information that is helpful for their trip planning. IRs, on the other hand, read the whole brochure more thoroughly. Some of them even read the parts that interested them twice and used the table of contents to locate the section that they wanted to read in detail.

Although they had different reading behaviors while browsing the whole brochure, eye movements on a single page showed similar patterns. They did not distribute their attention evenly on a page; instead, they fixated on the key information that most grasped their attention and then read the surrounding information. The key information acts as a reference point that gives readers an impression of what that page is about, and then they can decide whether they would like to keep reading the information.

Heat maps are useful for identifying reference points as they are created based on fixation durations to visually demonstrate how long people spend looking at a certain area. Fixation duration refers to "[d]uration of each individual fixation within an AOI" (Tobii Studio User's Manual, n.d., p. 106). If an AOI has a longer fixation duration, it means people pay more attention to that area. The color red stands for longer viewing time, whereas green means that participants spent less attention on that area. Because the view time per stimulus is not fixed in this research, the relative duration heat maps were adopted, and radius was set as 50 px. Through heat maps, this research found four types of reference points: photo credits, photos, headings and bolded words. Some examples of heat maps are shown in Figure II. This reference-point reading behavior was also confirmed by the participants: "Usually I would look at the pictures first, if the pictures attract my attention then I would go on to look at words, and then those highlighted words" (SK Participant # 22) and:

> I think the titles attracted me the most. As I always read and browse fairly quickly in terms of tourist guides, I tend to grasp the most obvious information to read (IR Participant #2).

Heat map of an ad | Heat map of the calendar of events | Heat map of tourist attraction introduction

Figure 2.
Some examples of heat maps

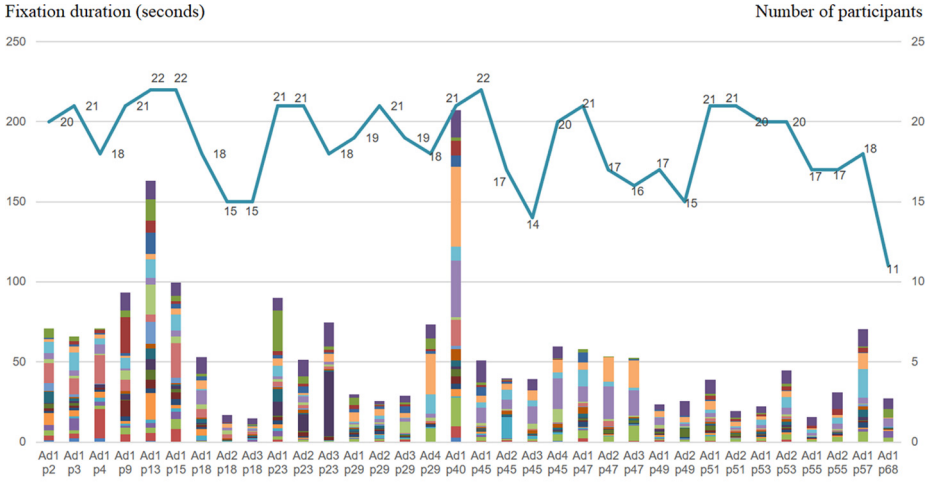
The reference points are especially important for triggering people's reading interests, so special attention should be paid when designing these parts.

Attractive components, readers' attitudes and suggestions

The survey questions "The brochure helped me in planning my trip" and "It would be more enjoyable if the Ottawa Visitor Guide could be designed better" received a mean score of 3.91 and 4.22, respectively. This suggests that the design of this current visitor guide is not optimal, and heed should be paid to improving its design.

There are four categories of information in the visitor guide, including ads, photos and photo credits, text content and maps. Because each has different formats, the attractive components were examined based on fixation durations along with the survey answers and interview transcripts within each category. The results are helpful for explaining the characteristics of the attractive components (RQ2), understanding readers' attitudes (RQ3) and giving implications for designing an appealing visitor guide (RQ4).

Ads. There are a total of 34 ads in the visitor guide, encompassing the advertising messages of commercial brands, tourist attractions, hotels, restaurants, etc. Overall, participants spent a longer time reading the ads in the first half of the guide than those in the second half. This is consistent with the cognitive load theory which suggests that people's attention decreases because of cognitive overload (Sweller, 1994) (Figure III). SKs and SCs spent similar amounts of time looking at these ads (M_{SKs} = 1.56 s, M_{SCs} = 1.59 s), whereas IRs spent more than twice as much time (M_{IRs} = 3.76 s). The ads of the Canadian Museum of History (p. 13) (M_{SKs} = 2.82 s, M_{SCs} = 6.75 s and M_{IRs} = 10.17 s) and Nordik Spa-Nature (p. 40) (M_{SKs} = 5.68 s, M_{SCs} = 4.26 s and M_{IRs} = 14.89 s) warranted the longest duration. SK Participant #20 mentioned that "I saw the spa advertisement because I didn't know there is a spa in Canada. I will Google it for further information and to know how to get there." SK Participant #3 also expressed that she was intrigued by the spa picture and would like to visit the spa. However, some ads did not attract people's attention at all. Two ads on page 18, one ad on page 45 and one ad on page 49 were ignored by eight participants who felt there was too much text, which discouraged them from looking at them; the ads were small



Note: Each color stands for one participant

Figure 3.
Fixation duration for each ad and number of participants who looked at each

in size, making them less attractive; and the background color was too dark to easily read the text.

Most participants dislike ads as can be seen by their responses to the statement "I like to read advertisements in the visitor guide": over half answered with "disagree" or "strongly disagree" ($\bar{x} = 2.57$). Some participants explained that they do not trust advertisements and often ignore or skip them altogether when reading visitor guides. They believe social media to be a more reliable information source, so they would prefer to browse websites to check the experiences of other tourists to see whether the place is really good or not. They also suggested that adding the information from social media could validate the content. Additionally, four participants mentioned that the ads unrelated to travel in the visitor guide bothered them. In the words of IR Participant #6: "I'm looking for events, and it's trying to sell me jewelry, I'm not really looking for this." SC Participant #8 also expressed that unrelated ads are distracting and hoped this content would be deleted.

Despite these negative attitudes, about one-third of participants said that they somewhat enjoyed reading the ads. Those designed with beautiful pictures made reading more interesting. Also, ads that delivered important information that is useful for planning a trip found favor as indicated by SK Participant #20:

> I believe when they make an advertisement, professional marketing guys think twice, three times to say their point, so I just respect their effort. So, when I'm interested in some advertisement, I will Google it further to get more detailed information.

Photos and photo credits. The visitor guide has 91 photos in total, covering restaurants and food, tourist attractions, activities and events. The average time SKs, SCs and IRs spent looking at each photo varies ($M_{SKs} = 0.99$ s, $M_{SCs} = 1.55$ s and $M_{IRs} = 1.88$ s). These three groups all paid more attention to some photos but skipped others (Figure IV). They intensively viewed the photos of cycling alongside the Rideau Canal ($M_{SKs} = 7.42$ s, $M_{SCs} = 10.73$ s, $M_{IRs} = 10.84$ s), RBC Bluesfest ($M_{SKs} = 2.35$ s, $M_{SCs} = 3.70$ s, $M_{IRs} = 7.00$ s), Pink Lake in Gatineau Park ($M_{SKs} = 2.42$ s, $M_{SCs} = 3.62$ s, $M_{IRs} = 4.61$ s), Parliament Hill ($M_{SKs} = 2.98$ s, $M_{SCs} = 4.76$ s, $M_{IRs} = 4.32$ s) and Canadian Museum of Nature ($M_{SKs} = 2.86$ s, $M_{SCs} = 3.14$ s, $M_{IRs} = 3.58$ s). These photos showed beautiful nature, interesting events or famous

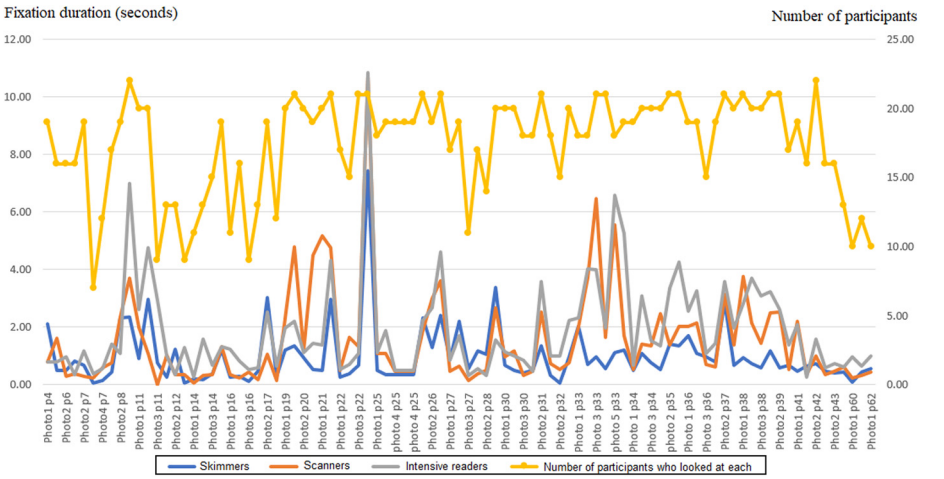


Figure 4.
Fixation duration for each photo and number of participants who looked at each

tourist spots in Ottawa. Some other photos with unappealing content or in small size and dark color received very little attention from them. They just very quickly scanned the photos (less than 0.5 s) or even completely ignored them. For example, some photos in the Calendar of Events (pp. 6-18) are much smaller than the others, so the number of participants who looked at these photos is fewer. Additionally, the photos on pages 60-62 in dark color were not attractive to participants.

The question "I like to read photos in the visitor guide" received a mean score of 4.13, indicating that most participants liked the photos. They prefer a visitor guide to have many because photos make reading more enjoyable. SC Participant #7 mentioned that "There are definitely a lot of pictures, [. . .], [which] make[s] it easier to scan through it and pick out what was interesting for me." Photos can also deliver more vivid information: "the photo gave me a more direct image of what is happening" (SK Participant #22). More importantly, photos leave a deeper impression in people's mind compared to text. When participants were asked about what information they remembered from the visitor guide, most of them referred to specific photos. Ten participants mentioned that their perceived destination image of the city changed somewhat because they saw the photos depicting natural beauty (e.g. The Arboretum and Pink Lake) and activities (e.g. bike tours and rafting). They originally thought the capital city was just about Parliament Hill and museums. However, after reading the visitor guide, participants realized that the city has many fun things.

Text content. Text is the descriptive information about restaurants, food, tourist attractions, activities and events. SCs (M = 11.08 s) and IRs (M = 18.22 s) fixed on the content of each page much longer than SKs did (M = 3.72 s). The section of Calendar of Events attracted attention because it gives an overview of what is happening in the city (SK Participant #22). Although people viewed the sections of famous attractions and tours in the city for a longer time, about one-third of them mentioned that they did not enjoy reading them because they felt overwhelmed by the text-heavy content. The small font size, narrow spacing and long sentences decreased their reading interest. SK Participant #19 said that "This visitor guide is informative, but in my opinion, it's wordy – too many words". Some participants indicated that bolded words were eye-catching. They often looked at them to know key information without reading whole paragraphs. Additionally, some participants mentioned that they would like to go to the places introduced in the visitor guide, but there is no detailed information provided (e.g. opening hours, addresses, locations) (Participant SC #8, IR #10, IR #11).

When participants were asked to indicate their level of agreement with the statement "I like to read text in the visitor guide" and "I trust the information delivered in the visitor guide", they rated them with a mean of 3.52 and 4.5, respectively. The question "The listing at the end is helpful in planning a trip" received a score of 3.5; however, seven participants gave it a score of 5 (strongly agree) believing that the listings are well-organized, and that they could easily pick the places and restaurants from it. The short introductions, addresses and phone numbers were useful for trip planning. Others expressed were quite negative in their opinion: "I don't appreciate the layout of the list when trying to plan a trip. They lack details, which make me very hard to choose which one over another" (IR Participant #2). Interestingly, all SKs gave this statement a score of 4 or 5. Because they did not want to spend much time reading the visitor guide, a list format was very helpful for them to browse information.

People suggested that this section could be associated with some pictures, which can help readers to compare places and make decisions (Participants IR #2, SC #4, IR #6, SC #9, IR #10 and SC #18). Including rankings or evaluations from TripAdvisor or Yelp is also recommended by participants. They want to know how other tourists think about the places

instead of just hearing from service providers. Participants gave relatively high scores for the statements regarding online information: the statement "Other online reviews (e.g. TripAdvisor, Zicasso) are more informative" received a score of 4.02, and "I trust the information of online reviews (e.g. TripAdvisor, Zicasso)" scored 4.11. Participants' attitudes indicated the importance of integrating the information from social media.

Some pages are appealing to all three groups, such as Natural Wonders, Canadian Heritage, Events, Listing of Entertainment and Listings of What to Do (Table III). People read these pages for a longer time for three main reasons. First, the text matched their travel interest. As most participants mentioned, they wanted to get close to nature or have unique experiences. Second, participants like the list format, so they read events and listings to see where they can go. Third, people need some practical information, which cannot be found on social media, like Trip Advisor. For example, special attention was paid to the gratuity in the section of Practical Information. This information can help people to feel more at ease in an unfamiliar destination. Some pages were considered most unattractive. People quickly scanned these because the text did not appeal to them. Most of the participants did not have children, so were not interested in reading the section of All in the Family, which introduces activities for kids. In terms of events and listing, the list format enabled participants to know the information quickly. If participants had no need for it, they would skip all of it immediately, so some of these pages received very little attention.

Maps. There are three maps at the end of the visitor guide. A total of 18 participants studied the maps, and the average time spent on each by SKs, SCs and IRs was 7.82, 16.76 and 20.38 s, respectively. SKs looked at the Eastern Ontario Map (6.67 s) and Regional Map (11.81 s) for a longer period compared to Capital Sights Map (4.97 s). Participants SK #3 and SK #19 mentioned that they planned to go to some places near the destination so they

Table III.
The most/least attractive text content (mean of fixation duration; unit: s)

Ranking	Skimmers	Scanners	Intensive readers
1	Natural Wonders (14.56)	Listing: Where to Eat (33.91)	Natural Wonders (42.04)
2	The Great Outdoors (12.30)	Get Out, Get Around, Get Inspired (31.05)	Taste and Talent III (32.15)
3	Ice Escapades (11.73)	Natural Wonders (29.17)	Events: July (30.79)
4	Canadian Heritage (8.18)	Listing: What to Do (25.23)	Listing: What to Do (30.47)
5	Listing: Entertainment (7.65)	Canadian Heritage II (22.95)	Listing: Entertainment (29.10)
6	Events: April and May (7.08)	Canadian Heritage III (20.54)	Practical Information (28.85)
7	Neighborhoods (6.79)	Listing: Entertainment (17.61)	Taste and Talent II (28.61)
8	Listing: What to Do (6.59)	Listing: Where to Stay (17.17)	Canadian Heritage III (26.83)
9	Get Out, Get Around, Get Inspired (6.37)	Events: August (17.11)	Events: July II (25.50)
10	Magic Marketplace (5.30)	Listing: Sports and Outdoors, Neighborhoods (16.72)	Magic Marketplace (25.36)
...	...	...	...
42	Canadian Heritage III (0.84)	Events: April and May (3.35)	Listing: Shopping (6.68)
43	Listing: Sightseeing Tours II (0.63)	Outdoor Sports (3.20)	Canadiana: The Capital Experience (4.28)
44	Listing: Shopping (0.63)	Events: December and February (3.13)	All in the Family II (4.20)
45	Listing: Spa, Sports and Outdoors (0.20)	All in the Family II (2.77)	Outdoor Sports (4.07)
46	Listing: Camping and Residence (0.19)	Listing: Camping and Residences (0.57)	Listing: Camping and Residences (3.62)
47	Listing: Where to Eat II (0.12)	Scenic Routes (0.12)	Scenic Routes (1.61)

looked at the two broader maps. However, they found the maps were not very helpful: no tourist spots were listed in the Eastern Ontario Map, and the places highlighted in the Regional Map were not appealing to them. Reversely, both SCs and IRs paid more attention to the Capital Sights Map (M_{SCs} = 30.82 s and M_{IRs} = 25.31 s) as they wanted to determine which attractions are close together so that they could visit them on the same day. However, the map just lists a few attractions, and participants were not able to find their locations: "I'm quite confused about where the attractions are, and which ones are close to other ones, so it's very hard to plan" (SC Participant #18). The maps also do not show the restaurants and hotels identified in the visitor guide, making it hard for participants to decide where they might like to dine.

Overall, people were not satisfied with any of the maps. The rating for the statement "The maps at the end are helpful in planning a trip" had a relatively low score of $\bar{x} = 2.86$; the questions "It is easy for me to find the location of the destination that I would like to visit", "I know how to get to the destinations (e.g. bus or walk)" and "I need Google Map to find the location of the destinations" were rated with 3.18, 2.36 and 4.68, respectively. Participants suggested some improvements for their design. First, maps could be moved to the third or fourth pages of a visitor guide. It enables people to have a general sense of the layout of the city at the beginning of their perusal. Second, maps should reflect the visitor guide content better. Attraction names could be listed beside a map, and numbers can be used to link attraction names, their location on the map and the page number where information about them can be found. Third, some recommended routes should be shown on the map. People can follow the routes to experience the city. Fourth, two more maps could be added: one for the locations of restaurants and hotels; another for the locations of events and activities. People visit the city not only to see attractions, but also to explore its culinary scene and interesting events.

Conclusion and discussion

Theoretical contributions

This research is the first study adopting a triangulated approach using eye-tracking, surveys and in-depth interviews to investigate how readers browse a voluminous visitor guide and examine its attractive components. Previous eye-tracking studies are largely limited to examining the stimuli with single information, such as tourism photos (Wang and Sparks, 2016; Li *et al.*, 2016) and magazine ads (Scott *et al.*, 2016). As suggested by Wang and Sparks (2016), images in conjunction with text should be examined to provide insightful findings. This study bridged the literature gap by investigating the design of a visitor guide containing 68 pages. The combination of text, advertisements and photos shed light on how people read different components when they are all present. This research proposes the concept of reference-point reading behavior: people do not spend attention equally on each page of a visitor guide; instead, they look at the reference points and then read the adjacent areas if the information triggers their interest. Through eye-tracking and interviews, four key reference points were identified, including photo credits, photos, headings and bolded words. These parts are especially crucial for designing a visitor guide because people skip the whole content if these reference points cannot stimulate their reading interest.

The findings of this research confirm and extend four aspects of the theory of selective attention. First, it confirms that people have selective attention when reading a visitor guide. The focal attention constrains people's ability to see several objects at once (Duncan, 1984), centering people's attention on certain areas of stimuli deemed important while other parts blend into the background or go completely unnoticed. This is especially the case for visitor guides, which offer a large amount of information requiring people to use selective attention

to process more effectively and with less effort. The results support that people look at certain attributes of the visitor guide to understand its content and tune out insignificant details.

Second, this research demonstrates the pattern of selective attention when people read a visitor guide. Selection is necessary because of the limits on people's capacity to process visual information (Carrasco, 2011), evidenced by the fact that many people spent more time reading the first half of the visitor guide, because perception is a limited-capacity process (Murphy *et al.*, 2016). Their attention was also influenced by the task of planning a two-day trip. Participants paid less attention to commercial ads and the introduction of tourist spots that they thought to be boring. This finding highlights the importance of the content in the first half of the guide and the significance of the relevance of the information.

Third, it contributes to the literature by understanding the pattern of selective attention of different types of readers. The three categories of readers – skimmers, scanners and intensive readers – identified in previous research (Brenna, 2012 and Lawrence, 2015) were validated through this study. Although they spent varying amounts of time on reading the visitor guide, they all had the reference-point reading behavior. Interestingly, the attractive components were the same for all three categories of readers based on the fixation duration (Figure IV). It indicates that the selective attention paid to certain areas was similar, but the actual time differed.

Fourth, this study extends Garner's (1978) selective attention theory by identifying the critical attributes of a visitor guide. Garner (1978) proposes two types of stimulus property, including the attributes that define the information and the particular stimuli attributes. This study found that photo credits, headings and bolded words in a visitor guide are the first type of stimulus property because they summarize the adjacent parts and help people more quickly grasp the key information. Photos are the second type of stimulus property as they are different from the text and more eye-catching. It gives insights into the critical attributes that capture people's attention when reading a visitor guide.

Finally, this study addresses a common critique of selective attention research, namely, that it tends not to reflect real-life behavior (cf. Murphy *et al.*, 2016). By providing participants with a realistic task, an existing document and no time limitation, this study goes beyond the artificial situations that are the setting for many attentional research paradigms.

This manuscript also provides a comprehensive summary of previous eye-tracking studies in tourism and hospitality that highlights what has been done to date. The detailed description of the triangulated approach (Figure I) lays a foundation for future studies that wish to use this approach. Four research questions are posed at the end of this paper to give directions for future studies.

Furthermore, the two unique practices of this research have implications for triangulated eye-tracking studies. Although other researchers adopted a triangulated approach, their interview questions asked participants about the importance of online information sources (Mariussen *et al.*, 2014) and their reasons for the ratings (Hao *et al.*, 2015), whereas this study probed participants about their eye movements. When participants read the stimuli with the eye-tracker, two researchers observed participants' eye movements on the device and noted the components that seemed particularly attractive or were completely ignored. Participants were then shown some clips of their eye-tracking videos and asked to explain the reasons for looking at or ignoring specific areas. This practice gave the researchers a deeper understanding of people's visual behaviors. Finally, no time limit was imposed on participants to allow them to behave as naturally as possible. The collected eye-tracking

data can reveal the attractive as well as the ignored information, and the time that people spend reading the different components.

Practical implications for destination management organizations

From a practical perspective, suggestions on visitor guide design are based on people's actual reading behaviors. First, although advertisements provide financial support for visitor guide publication, ads unrelated to the destination may lead to people's negative attitude toward it. Therefore, unrelated ads should be avoided because they deter from the reading experience and information delivered in ads should be clear so that people know what it is about. If ads are better integrated with the introduction of tourist spots, people would pay more attention to them. Additionally, DMOs need to seek greater financial investment by fewer advertisers for larger ads because these receive more attention.

Second, photos in a visitor guide play a very important role in catching attention and triggering interest as long as they are appealing. For photo and photo credits, there needs to be a stronger connection between them and the text. The size and color of photos are also important because small and dark ones are often ignored.

Third, long and tedious sentences should be avoided because people may feel bored and therefore skip the section. Bolded words and list format can help people to grasp information more quickly and makes reading more enjoyable. Bigger font size is very necessary as according to the concept of reference-point reading behavior, a font size that is too small does not capture attention. To make the content more attractive, stories or selected comments from social media, such as TripAdvisor and Yelp, could be included. People prefer to hear from others about their travel experience instead of just knowing the facts (e.g. establishment year, length and height). In addition, rankings or star evaluations of places and restaurants (e.g. based on TripAdvisor or Yelp) could be included to help people compare and make decisions. Detailed information (e.g. a short description of each event; opening hours, price and location of attractions) could be provided because this type of information is not easily found on social media, and makes the guide more meaningful.

Finally, including well-designed maps is crucial as it not only gives readers a first impression of what a city can offer, but also serves as an index to help in the exploration of the visitor guide. Three big maps (attraction map, activities and events map and restaurant map) could be presented at the beginning to give readers a first impression of what the city can offer. Numbers could be used to link the places introduced and their locations on maps, and recommended routes would be helpful in providing a better city experience.

In summary, "impactful print advertising uses the size, spread and tactile quality of print along with effective design and evocative headlines to create an emotional connection with the reader" (Adams, 2017). Although the younger generation tends to search for attractions and directions online, this information is relatively scattered. A travel guide is more systematic in terms of gathering all the information in one place, and typically includes events and activity schedules, which TripAdvisor may not have. These suggestions could help tourism marketers in designing a better visitor guide.

According to Adams (2017), DMO or tourism bureau visitor guides enjoy great trustworthiness. What's more, a print copy is especially helpful when people do not have internet connection. Overall, visitor guides are still useful and important for both destinations and tourists.

Limitations and future research

This study collected data from 22 university students. Even though their ages range from 18 to 35, all participants have a relatively good education background. This commonality may

lead the participants to express similar reading behavior. In future studies, a broader population could be recruited. Although most eye-tracking studies had a sample size of 15-30 (Table I), future studies should aim at generalization.

The triangulated approach used in this research provides a good guideline for future studies. The following research questions could be examined through this approach: Does visual behaviors differ when reading visitor guides online or offline? Which version would be considered more helpful for planning a trip? DMOs often offer two versions of brochures to cater to different visitors' needs. If a choice needs to be made for budgetary reasons, DMOs are inclined to provide a digital version only. However, whether the roles of these two versions significantly differ has not been tested, but it would be important for DMOs to know which version they should offer and who the target audience is for each one. Which component of a visitor guide plays a more important role in changing the perceived destination image? This research found that images seemed to be important in changing perception as participants mentioned that these gave them a direct impression of the destination. Future research could examine the different roles of the components (i.e. images, text, lists and maps) in generating destination image changes and visit intention. Are there differences between domestic and international tourists in how they read a visitor guide? To attract key market segments, DMOs sometimes offer visitor guides in other languages in addition to English. The design of these visitor guides is the same, only the language differs. However, visitors with diverse cultural backgrounds may have different reading preferences. Therefore, there is a need to understand whether readership differs and how to offer an appealing visitor guide for different key market segments. Do people change how they read the guide based on their motivations? Tourist motivation is a well-established research area. Because people have different purposes in visiting a destination, they may also have different visual behaviors. The link between readership and tourist motivations could give insights into designing visitor guides for particular tourist types (e.g. cultural tourists, eco-tourists, adventure tourists, etc.). Overall, the triangulated approach offers a great potential for investigating and understanding people's visual behaviors and provides insights for designing a better visitor guide. The application of this approach introduced in the current paper lays down a clear guideline for future studies.

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