



The Review of Regional Studies

The Official Journal of the Southern Regional Science Association



What Landmarks Do Visitors Remember about a Place?*

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Abstract: This paper examines the features of photographs that affect the memorability of landmarks that tourists walk past while visiting a place. Empirical results, based on surveys of cruise passengers that visited Bar Harbor, Maine, suggest that a mix of salient images (e.g., the ocean) and unique characteristics of a place (e.g., architectural elements) increase a visitor’s likelihood of remembering a landmark. An extension to the analysis shows that survey respondents are unlikely to attribute “fake” landmarks from different places to their day spent in Bar Harbor. The methods from this study can be employed in other places to examine the behavior and perceptions of tourists, and, more generally, photographs can be used to learn about how people interact with the places around them.

Keywords: photographs, memory, places, visitors

JEL Codes: R19, L83, Z39

1. INTRODUCTION

Most places are characterized by a combination of their people, culture and customs, natural environment (e.g., mountains, ocean), and built features (e.g., buildings and architecture). An image of the Eiffel Tower is almost universally associated with Paris, just like a picture of the Statue of Liberty puts you in a New York state of mind. A postcard of a sandy beach might summon memories of a trip to Hawaii (or Florida or Tahiti), while a painted landscape of rocky coast is often associated with the U.S. Pacific Northwest or New England. Although some iconic images are immediately recognizable and connected to a specific place, even by people who have never seen them in person, most pictures are far more difficult to pin to a particular location. A photo of a chain restaurant or big-box store could be from just about anywhere, while an image of a small independent business (e.g., a mom-and-pop restaurant located in the downtown of a medium-size city) would be unrecognizable to most.

*The project received funding from the Maine Port Authority / Cruise Maine and the Town of Bar Harbor. Gabe’s research program is also funded—in part—by Hatch Multistate Grant #ME031808 (NE 1749) from the USDA National Institute of Food and Agriculture. I would like to recognize Dominic Gayton, Sean Larkin, James McConnon, and Patrick Robinson for their assistance with data collection, and Dr. Tammy Leonard (Editor) and the anonymous referees for providing helpful comments. Todd Gabe is a Professor of Economics at the University of Maine, Orono, ME. *Corresponding Author:* Todd Gabe E-mail: todd.gabe@maine.edu.

Over time, people become familiar with their surroundings and the images they see on a regular basis. For example, New Yorkers who spend time in the area are accustomed to seeing the most famous landmarks in and around Times Square, but they can also recall some of the lesser-known scenery (e.g., business signs, specific buildings) located in this section of the city. A visitor to New York, on the other hand, could possibly identify the best-known landmarks they saw around Times Square but may struggle to recall many of the exact buildings and business signs located in the area. In fact, visitors to New York City might mistake a picture of a mom-and-pop restaurant from a different city as an eatery that they thought they saw while walking around Times Square.

The purpose of this study is to examine the features of photographs that affect the memorability of landmarks that people walk past while visiting a place. Specifically, the analysis focuses on a survey question that asks cruise passengers to circle pictures of landmarks that they walked past during a one-day port-of-call visit in Bar Harbor, Maine. Tourists, particularly cruise passengers, are an ideal group of people to examine the memorability of landmarks. Cruise passengers enter a port-of-call at a fixed point (in the case of Bar Harbor, a facility where tenders bring visitors to shore), which facilitates the identification of landmarks that people likely walked past while in town. A focus on cruise passengers also provides a reasonably controlled experiment because they are in town for a short amount of time, and most of them are previously unacquainted with the area. Likewise, Bar Harbor provides an ideal setting for an analysis of the landmarks that people remember about a place. It has a mix of natural (e.g., the ocean) and built features and architectural elements such as a fountain and pergola. In addition, Bar Harbor has a few main streets that are explored by cruise passengers. These streets are lined with shops, restaurants, and green spaces (i.e., parks), which have a variety of building styles (and business signs) and a couple of town clocks. Many of these elements are included as pictures on the survey of cruise passengers to determine the memorability of landmarks.

This paper makes several contributions to the regional science and tourism literature. Findings on the features of images that make them memorable to visitors provide evidence of an often-overlooked impact of tourism on a region, which is how places are remembered. Although regional scientists have looked at the economic impacts of tourists on regions (Burnett et al., 2007; Gunderson and Ng, 2005; Hughes and Shields, 2007; Leatherman and Marcouiller, 1996; Thompson, 2007), much less is known about the memories of a place that visitors take with them. In addition, the paper demonstrates how pictures can contribute to a greater understanding of the connection between people and places. Whereas regional scientists have used satellite pictures to study aspects of regional growth such as land-use change and the aggregate economic activity of areas (Donaldson and Storeygard, 2016; Florida et al., 2012), they have devoted less attention to the use of visual images in the analysis of neighborhood characteristics and how people relate to a place. The paper also provides a novel approach to examine people's recall using photos. Although many studies have examined the memorability of images in a laboratory setting by testing if people can recall seeing a photo, this study is one of the first to test a respondent's memory of scenes observed in "real life."

2. BACKGROUND AND LITERATURE REVIEW

Regional scientists have used photos, broadly defined, in the study of “space” and, to a lesser extent, “place.”¹ Using satellite photos and remote sensing, research has examined elements of space (i.e., location of activities) related to urban growth and changes in land-use patterns (Donaldson and Storeygard, 2016; Patino and Duque, 2013). For example, photos that are literally taken from space provide relative estimates of economic activity across regions (Florida et al., 2012; Henderson et al., 2012). At a more intimate scale, regional scientists have also used photos of residential neighborhood scenes to examine resident preferences for the appearance of the places where they reside (Peterson, 1967).

Whereas research in regional science has more extensively used large-scale remote sensing images and aerial photographs to track the growth and change of regions (Donaldson and Storeygard, 2016; Patino and Duque, 2013), tourism studies have employed small-scale photographs to analyze visitor behavior in a destination and a region’s image to tourists (Balomenou and Garrod, 2019; Deng and Li, 2018; Pan et al., 2014; Vu et al., 2015; Zhang et al., 2019). The current project uses small-scale photos of local landmarks, similar to the focus of tourism studies, to examine the sites that are memorable to visitors of an area. The study results go beyond tourists, however, and speak to how people interact with a place. In addition to scenes that are memorable to visitors, the landmarks that define a region contribute to a sense of place that is important to the community and regional development.

Previous research has examined the characteristics of photographs that make them memorable to people (Lu et al., 2016; Konkle et al., 2010; Spain and Perona, 2008). Although these studies generally test the memorability of images by asking subjects to look at pictures in a laboratory setting—and do not ask about recognition of scenes observed in “real life”—findings from this research provide useful context for our analysis. For example, Isola et al. (2013) and Khosla et al. (2015) find that images of people are easier to recall than natural landscapes and, more generally, pictures with salient actions and events are memorable. In addition, Khosla et al. (2015) suggests that people are more likely to remember pictures with “few specific objects to fixate on, which would tend to imply that the image contains more close-ups or larger objects.” The nature of our study, which focuses on landmarks and places that tourists walk past while visiting a destination, does not lend itself to asking respondents about their memory of people in images. The photos used in the survey, however, have a mix of features that are salient to Bar Harbor and more generic images such as street scenes in the areas of town where cruise passengers explore. Likewise, the surveys include pictures that are close-ups of (single) large objects, as well as landscape images with multiple features.

In the tourism literature, research has examined photographs in a variety of applications, but they are not typically used on visitor surveys to ask them if they walked past particular landmarks. Previous tourism studies use photos to examine visitor behavior (Vu et al., 2015; Zhang et al., 2019), and the perceived image of a destination (Deng and Li, 2018). Tourism

¹Johnson (2002) makes a distinction between theories of space (“location of activities relative to other activities”) and place (“active relationships between people and places—relationships in which places have unique characteristics and individuals have unique preferences”) and calls on regional scientists to devote more attention to how people interact with the places around them.

studies have also examined geotagged photos posted on social media (e.g., to analyze the behavior of tourists) and used photos on surveys to examine the bonds between tourists and places (Cheng and Kuo, 2015). The current study uses photos on a survey (and not geotagged photos shared on social media) to learn about the landmarks that cruise passengers walked past while in port. But instead of using photos to track passenger movements while in port, we use them to examine the characteristics of images that influence whether or not a tourist remembers a landmark that they (likely) walked past.²

Based on the finding of Khosla et al. (2015) that salient features are memorable in photos, we expect image characteristics that are most important to a cruise passenger's stay in Bar Harbor to influence a landmark's recognition. Given the popularity of shopping and dining to the day spent in port (Brida and Zapata, 2010; Gargano and Grasso, 2016; Henthorne, 2000; Vayá et al., 2018), photos of stores and restaurants/bars are likely to be memorable to cruise passengers.³ Likewise, images that show the ocean, which is an important part of a cruise passenger's vacation, are expected to increase the likelihood of a passenger indicating that they walked past a landmark. Finally, as suggested by the literature on photo recognition, we expect that photos with large objects and close-up images will have a positive effect on a passenger indicating that they walked past a landmark.

Research suggests that people, when asked specifically to think about photos from a place, interpret the images through the lens of the person's memory and familiarity with the area (MacKay and Couldwell, 2004; MacKay and Fesenmaier, 1997). To examine this connection between photos and a person's impression of a place, Scott and Canter (1997) conducted an experiment asking subjects to sort groups of photos. With no direction (i.e., a "free sort"), the participants arranged the photographs by the context of the images. When asked "to think about the places in the photographs, and to sort the items according to their knowledge" of the area, the study participants sorted the images according to their memories and experience.

Cheng and Kuo (2015) suggest that pictures may even trigger a memory of places and experiences that are not portrayed in the image. Their study asked people to provide a location for photos viewed in a laboratory setting. Although none of the images depict scenes from Macau or Taiwan, the study participants associated Macau and Taiwan with 5.3 percent and 15.5 percent of the photos, respectively. This suggests that some people may falsely identify a picture of a scene that, in fact, they did not experience. To account for instances where people might mistakenly connect a photo to a place, even though the depicted image is not present, our study includes some photos of landmarks that are not located in the Bar Harbor area. This allows us to account for photos triggering a false memory of images that the respondents mistakenly recalled from their day spent in the area.

²To track the movements of tourists at a destination, De Cantis et al. (2016); Ferrante et al. (2018) Shoval (2008) use GPS technologies that are able to pinpoint where people explore, as well as total distance walked and walking speeds.

³Over 95 percent of the cruise passengers in Bar Harbor reported visiting at least one shop or restaurant, and one-third of the passengers visited ten or more shops and restaurants/bars (Gabe et al., 2017).

3. DATA AND APPROACH

The analysis is based on 1,414 surveys of cruise passengers that visited Bar Harbor, Maine, between May and October of 2016 (Gabe et al., 2017).⁴ Passengers were surveyed from 31 ships (e.g., Veendam, Independence, Norwegian Dawn, Regal Princess, and Serenade of the Seas) over 24 different days. The survey method involved distributing questionnaires to passengers as they returned to the ship after spending the day in Bar Harbor.⁵ Overall, the project team (faculty and students) distributed 4,768 mail surveys to passengers along with postage-paid return envelopes. Although we received 2,231 surveys (47 percent response rate), 817 of the returned surveys are not used in this analysis. The most common reason why surveys are excluded is that we cannot be reasonably certain that the passenger walked past the landmark of interest (this is discussed in more detail below). Since the analysis examines the characteristics of photos that influence the memorability of landmarks, we first need to determine that the person, in fact, walked past the landmark while in town. Other surveys were excluded due to missing information for some of the questions (e.g., passenger age, number of past visits to Bar Harbor), which are used as control variables in the analysis.

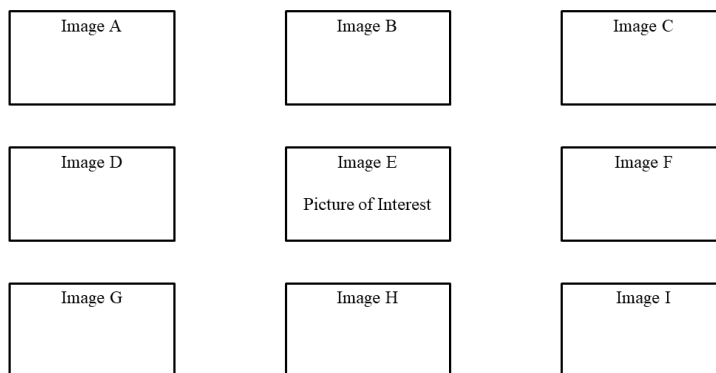
The empirical approach used in the study is a logit model on the effects of photo content and image characteristics on whether tourists remember landmarks they saw while visiting a place. The dependent variable has a value of 1.0 if the survey respondent indicates that they walked past a landmark while in Bar Harbor, described below, and zero if the respondent likely walked past the landmark but did not “check the box” on the questionnaire. A logit model is an appropriate method given the discrete nature of the dependent variable, which suggests that about one-half of the survey respondents circled the photo of a landmark that they walked past while visiting Bar Harbor. The explanatory variables used in the logit regression model are photo content and image characteristic attributes, described below and shown in table 1, along with variables that control for characteristics of the passenger (e.g., age) and the day spent in port (e.g., weather conditions, the month of the year).

The survey question used to examine the images that people remember about a place is a set of nine pictures arranged on a 3-by-3 grid (figure 1), and instructions that ask the respondent to “please circle the pictures below if you walked past these places in Bar Harbor.” The nine color photos shown on the survey include many of the best-known landmarks that cruise passengers walk past while in port, such as the Village Green Park, an art deco movie theatre, a museum, and a large wooden lobster that is located in front of an ice cream shop. In this paper, we examine a visitor’s recall of a landmark (i.e., the “picture of interest”) located along a section of Main Street between where passengers get off the ship (Harbor Place) and the Village Green Park (figure 2). This street, which is lined with shops and restaurants, is heavily explored by cruise passengers and land-based tourists in Bar Harbor. In addition, Main Street is the most direct route from Harbor Place, indicated by a star in figure 2, to the Village Green Park. The picture of interest is, in most cases, shown in

⁴See Appendix A for a sample version of the survey.

⁵As noted above, most cruise passengers enter and leave from Bar Harbor at a fixed point (i.e., Harbor Place), where passengers ride tenders to and from the ships that are anchored in the harbor. At the end of the day (i.e., before the ships depart from Bar Harbor), there were often queues of passengers waiting to board the tenders. This provided the research team with a good opportunity to hand out surveys. Surveys were distributed, however, across the entire day.

Figure 1: Photo Grid Used to Ask Survey Respondents if They Walked Past Landmarks in Bar Harbor



the center of the grid—i.e., middle row and middle column—of images used on the survey (labeled as “E” on figure 1). On some versions of the survey, the picture of interest is shown in a different position (other than the center), which allows us to control for a respondent’s tendency to, perhaps, focus on the center cell of the grid while filling out the survey.

Different versions of the cruise passenger survey include 24 images of landmarks that are located on Main Street between Harbor Place and the Village Green Park. To provide some examples, figure 3 shows the images used in four versions of the survey. Panel A is a photo of a fountain with the ocean viewable in the background. This landmark is located very close to Harbor Place, where cruise passengers enter the town. The picture’s vantage point, with the ocean in the background, is how it would be viewed by someone when walking along Main Street in the direction back to where the passengers return to the ship. When walking in the opposite direction (i.e., from Harbor Place to the Village Green), passengers would see the side of a building as the background to the fountain.⁶ Panel B of figure 3 is an image of a street scene with a few buildings in the background, but none that are particularly prominent in the photo. The shot is taken in the direction of the Village Green park, with the photographer’s back facing Harbor Place.

The third example photo, labeled as panel C, is of a “town clock” that is located in the Village Green Park, which is easily visible when walking along the sidewalk next to the park. Although the clock is in working order and it displays the correct time, it does not have a chime that would attract a passerby’s attention when it is ringing. The fourth example photo, shown as panel D in figure 3, is a retail store sign. The area of Main Street located between Harbor Place and the Village Green park has numerous restaurants and shops,

⁶This vantage point of the fountain, with a building in the background, is used on a photograph in a different version of the survey. Two-thirds of the survey respondents who (likely) walked past the landmark circled the photo of the fountain with the ocean in the background, compared with 47 percent circling the fountain photo with a building in the background.

Figure 2: Map of Downtown Bar Harbor Showing Area of Main Street between Harbor Place and Village Green Park

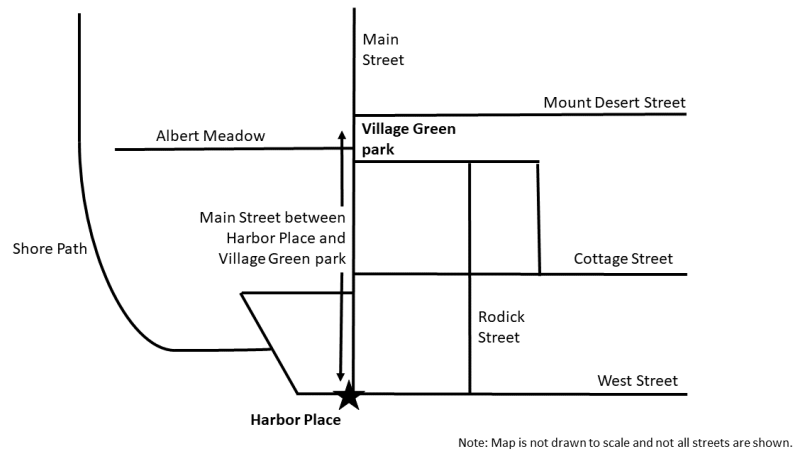


Figure 3: Examples of Images Used on Four Versions of the Cruise Passenger Survey



Panel A



Panel B



Panel C



Panel D

and signs for other businesses were used on different versions of the survey. In addition to the 24 photos of landmarks situated on Main Street between Harbor Place and the Village Green park, different versions of the survey included seven photos of landmarks that are not located in Bar Harbor. These include pictures of the tower on a church located in Sweden, a sculpture from a park located in South Carolina, and images from the Walt Disney World and Sarasota, Florida. These versions of the survey are used to test whether pictures can trigger a false memory of images that the respondents mistakenly recalled from their day spent in the area.

Table 1 presents a description of the photo attributes used in the analysis, as well as the percentages of completed surveys in which the picture of interest has the feature. The features used to describe the photos are separated into photo content and image characteristics. The most common subjects are pictures of signs (56 percent, in the sample that includes landmarks located in and outside of Bar Harbor) and images depicting retail stores (34 percent) and restaurants/bars (22 percent). Other subjects include architectural elements (21 percent), street scenes (21 percent), pictures of the ocean (8 percent) and clocks (7 percent). As an example of how the pictures on the survey connect to these features, the image of the store sign shown in panel D of figure 3 is characterized as a “sign” and a “retail establishment”. Likewise, the fountain shown in panel A of figure 3 is described as an “architectural element” and as depicting the “ocean”.⁷

The image characteristics considered in the analysis are whether the photo is a close-up (61 percent of the photos) and whether the photo focuses on a single subject (68 percent of the images). Based on these characteristics, the store sign in panel D of figure 3 is both a close-up image and features a single subject. The fountain shown in panel A of figure 3 focuses on one subject, but it is not a close-up image. The street scene shown in panel B is neither a close-up nor does it focus on a single element. Although not a feature of the image itself, the regression analysis includes a variable that controls whether the picture of interest is positioned in the center cell of the 3-by-3 grid. In about 90 percent of the surveys, the picture of interest occupies the center cell.

The empirical analysis focuses on the effects of the characteristics shown in table 1 on whether or not a cruise passenger remembers walking past the landmark while in Bar Harbor, which is indicated by circling the photograph on the survey. In order to remember walking past a landmark, however, the passenger needs to have walked past it. This means that a preliminary step in conducting the analysis is to identify passengers that walked past the landmark shown on their survey. To do this, we use information from several different survey questions. First of all, we assume that a passenger walked past the landmark if the picture of interest—i.e., the landmark located on Main Street between Harbor Place and the Village Green Park—is circled on the survey. When the picture of interest is circled on the survey, we assume that the passenger walked past the landmark and, subsequently, recalled the image when completing the questionnaire.

To identify survey respondents that walked past the landmarks but did not remember seeing them, we use information from the other eight photos included in the survey (see

⁷The picture of the fountain with a building in the background (see footnote 6) is characterized only as an “architectural element.”

Table 1: Photo Content and Image Characteristics

Variable	Definition	Percentage of Observations	
		A	B
Photo Content			
Sign	Photo shows a sign	60%	56%
Retail	Photo shows a retail business	37%	34%
Restaurant/Bar	Photo shows a restaurant or bar	27%	22%
Street Scene	Photo shows a street scene or alleyway	24%	21%
Ocean	Photo shows the ocean	10%	8%
Architectural Element	Photo shows an architectural element (e.g., fountain, pergola, sculpture)	9%	21%
Clock	Photo shows a clock	9%	7%
Fake Landmark	Photo shows landmark located outside of Bar Harbor	0%	26%
Image Characteristic			
Center Cell	Image shown in center cell of 3-by-3 grid on survey	91%	90%
Closeup	Image is a closeup	63%	61%
One Element	Image has one main element	60%	68%
Number of Observations		1,045	1,414

Note: Photo content attributes and image characteristics are not mutually exclusive.

Column A reports percentage of observations from surveys with landmarks **in** Bar Harbor.

Column B reports percentage of observations from survey with landmarks **in and outside** Bar Harbor.

figure 1) and specific places that the passengers noted as visiting while in Bar Harbor. Along with the picture of interest in this analysis, which varies across the surveys, all of the questionnaires have the exact same picture of the Village Green Park. We assume that survey respondents that circled the image of the Village Green walked (at least) as far as the park, which means that they most likely walked past the landmark of interest (located on Main Street between Harbor Place and the Village Green).⁸ In addition, the set of nine images included on the survey feature landmarks located past the Village Green on Main Street (i.e., even further away from where passengers enter Bar Harbor), as well as landmarks (e.g., a wooden lobster in front of an ice cream shop) located on Main Street between Harbor Place and the Village Green.⁹

Finally, we identified passengers that walked past the landmark of interest using an open-ended survey question that asked the respondents to list the names of stores and restaurants that they visited while in Bar Harbor. If the passenger wrote down the name of a particular business that is located in a part of town that would likely require them to walk past the landmark of interest shown on the survey, we assume that the passenger walked past it. Although our method of determining the places where passengers walked while in Bar Harbor is not an exact science, the use of multiple pictures and an open-ended list of businesses visited—along with the observation that Main Street is, by far, the most explored street by cruise passengers and tourists of all types—provides a reasonable approach to identifying the passengers that likely walked past the landmark of interest.¹⁰ Across the 1,045 surveys completed by passengers who are assumed to have walked past the landmark of interest (in Bar Harbor), 48 percent circled the photo on their surveys.

Along with examining the effects of the photo content and image attributes on whether the visitor remembers walking past a landmark, the regression model also includes variables to control for characteristics of the passenger and the day of visit to Bar Harbor. The passenger characteristics are age, the amount of time spent in port, a dummy variable indicating whether the passenger had previously visited Bar Harbor, and a dummy variable indicating whether the passenger read at least three “Museum in the Streets” signs while exploring Bar Harbor. Results of the cruise passenger survey show an average age of 61 years (standard deviation of 12) and an average of 5.2 hours spent in port (standard deviation of 1.5).

The time spent in port variable and, to a greater extent, the dummy variable indicating past visits to Bar Harbor is used in the model to control for the survey respondent’s potential exposure to (and familiarity with) the landmarks around town. As noted in the introduction, the cruise passengers have a time constraint in Bar Harbor as most of the ships arrive between 7 am and 10 am, and most depart between 3 pm and 6 pm. This constraint provides a reasonably controlled experiment because, with a relatively consistent amount of time in the area, there are unlikely to be large differences in the number of times that the cruise

⁸Although it is possible to walk from Harbor Place to the Village Green park using different streets, Main Street is by far the most common street explored by cruise passengers and other visitors to Bar Harbor.

⁹For example, circling the photo of the wooden lobster does not tell us that a passenger walked past all of the landmarks located between Harbor Place and the Village Green, but it does suggest that passengers walked past landmarks located between Harbor Place and the wooden lobster.

¹⁰A more exact way to identify the passengers that walked past the landmarks would be to track them using their cell phones or a GPS device (De Cantis et al., 2016; Ferrante et al., 2018)

passengers walked up and down Main Street. By contrast, a study of land-based tourists would have considerably more heterogeneity in the number of times that the visitors may have walked past the landmarks.

Even with the time constraint imposed by the cruise ship itineraries, there could be some differences in the number of times the visitors walked up and down Main Street. The time spent in port variable controls for the pace at which the passengers explored Bar Harbor and perhaps the number of times that passengers may have walked past the landmarks, which might increase the likelihood of recall. Similarly, cruise passengers with past visits to Bar Harbor may have seen the landmarks in previous visits, which might increase the likelihood of remembering the landmark. Overall, the survey results show that the cruise visit was the first time in Bar Harbor for 69 percent of the passengers.

Along with the “time spent in port” variable that measures the pace of a passenger’s visit in Bar Harbor, the dummy variable indicating that they read three or more “Museum in the Streets” signs captures their interest in learning about the area and, perhaps, ability to observe their surroundings. Bar Harbor has 46 “Museum in the Streets” signs located around town, which provide an itinerary for a walking tour to area visitors. Results of the cruise passenger survey found that 23 percent of the respondents read at least three of the signs. In that reading the signs signals interest in learning more about Bar Harbor—and seeing the signs suggests that a passenger is observant of their surroundings—we expect to find a positive relationship between whether the passenger remembers walking past the landmark of interest and the dummy variable indicating that the passenger read at least three “Museum in the Streets” signs.

The day-of-visit characteristics considered in the analysis are temperature, sky condition (i.e., dummy variables that indicate rain and cloudy skies), the month that the ship visited Bar Harbor, and whether or not the visit took place on a Friday, Saturday or Sunday. The weather conditions might impact a passenger’s behavior while in port (e.g., a passenger might spend more time in stores and restaurants when it is cold outside) and ability to see the landmarks (rain could obscure a person’s vision). The month of visit controls for the number of tourists in Bar Harbor (visitor counts are highest in August and July), and the variable that indicates a Friday, Saturday or Sunday visit accounts for larger crowds on a weekend in New England.

4. REGRESSION RESULTS

Table 2 shows regression results (estimated coefficients and marginal effects) from a logit model on the effects of photo content and image characteristics on whether tourists remember landmarks they saw while visiting a place. Results related to photo content show that cruise passengers are more likely to indicate walking past scenes that include an image of the ocean, a clock, a street scene, an architectural element, a restaurant/bar and retail store. On the other hand, people are less likely to recall images of signs when visiting an area. The photo content attributes with the largest marginal effects are images pertaining to retail stores (marginal effect = 0.43), clocks (marginal effect = 0.41), architectural elements (marginal effect = 0.35), restaurants and bars (marginal effect = 0.33) and pictures showing the ocean (marginal effect = 0.26).

Table 2: Effects of Photo Content and Image Characteristics on Cruise Passengers Indicating that they Walked Past Landmarks Located in Bar Harbor: Logit Regression Results

Variable	Estimated Coefficients		Marginal Effects	
Constant	-0.78	(1.48)		
Sign	-0.66	(0.29) **	-0.15	(0.07) **
Retail	1.88	(0.36)***	0.43	(0.08)***
Restaurant/Bar	1.43	(0.34)***	0.33	(0.08)***
Street Scene	0.87	(0.43) **	0.2	(0.10) **
Ocean	1.12	(0.27)***	0.26	(0.06)***
Architectural Element	1.51	(0.57)***	0.35	(0.13)***
Clock	1.80	(0.37)***	0.41	(0.08)***
Center Cell	-0.19	(0.27)	-0.04	(0.06)
Closeup	0.81	(0.39) **	0.19	(0.09) **
One Element	-0.58	(0.25) **	-0.13	(0.06) **
Passenger Age	-0.01	(0.006)**	-0.003	(0.001)**
Three or More Museums in the Streets Signs	0.41	(0.15)***	0.09	(0.03)***
First Visit to Bar Harbor	-0.22	(0.14)	-0.05	(0.03)
Friday, Saturday or Sunday	-0.42	(0.17) **	-0.10	(0.04)
Temperature	0.01	(0.02)	0.002	(0.004)
Cloudy Skies	0.22	(0.29)	0.05	(0.07)
Rain	-0.30	(0.28)	-0.07	(0.07)
June	-0.77	(0.41) *	-0.18	(0.09)
July	-0.40	(0.37)	-0.09	(0.08)
August	-0.67	(0.40) *	-0.15	(0.09) *
September	-0.77	(0.44) *	-0.18	(0.10) *
October	-0.37	(0.30)	-0.08	(0.07)
Log Likelihood			-680.5	
Number of Observations			1045	

Notes: Standard errors are shown in parentheses. The superscripts ***, ** and * indicate statistical significance at the 1-percent, 5-percent and 10-percent levels, respectively.

The results pertaining to image characteristics show a positive relationship between a person indicating that they walked past a landmark and photos with a close-up shot of the landmark (marginal effect = 0.19), whereas there is a negative relationship between a person indicating that they walked past a landmark and photos that include a single element (marginal effect = -0.13). There is not a statistically significant relationship between a cruise passenger indicating that they walked past the landmark of interest and whether the photo is shown in the middle cell of the 3-by-3 grid on the survey.

Moving to the characteristics of the passengers and day of visit, we find that older passengers are less likely to indicate walking past a landmark, while visitors that read three or more “Museum in the Streets” signs are more likely to indicate walking past the landmark of interest. Passengers who visited Bar Harbor on a Friday, Saturday or Sunday are less likely to indicate that they walked past a landmark. The amount of time spent in port, the temperature and sky conditions (e.g., cloudy or rain, compared with an omitted category of clear skies) and whether it’s a person’s first visit to Bar Harbor do not have statistically significant effects on whether a cruise passenger indicates walking past a landmark.

As an extension to our analysis and to examine whether pictures may trigger a false memory of images that the respondents mistakenly recalled from their day spent in the area (Cheng and Kuo, 2015), we estimated a second version of the regression model using data that include respondents who received surveys with landmarks that cannot be found in Bar Harbor. Along with being coded as “fake landmarks,” these images are described using the photo content and image characteristics shown in table 1. For example, one of the landmarks from outside of Bar Harbor is a close-up image of an ice cream parlor sign on a facade in Walt Disney World’s Magic Kingdom. This image is characterized as a “sign”, “restaurant or bar”, “close-up” image, photo with a single element and a “fake landmark” that is not located in Bar Harbor. Including surveys with landmarks outside of Bar Harbor increases the sample size from 1,045 to 1,414 cruise passengers. Whereas 48 percent of the passengers with “real” landmarks indicated walking past them, only 12 percent of the passengers reported walking past the landmarks that are not located in Bar Harbor.¹¹ Overall, 38 percent of the survey respondents indicated that they walked past the landmark of interest in the analysis of the photos showing scenes that are (and are not) located in Bar Harbor.

Table 3 shows regression results (estimated coefficients and marginal effects) on the effects of photo content and image characteristics on whether a visitor indicates that they walked past a landmark, legitimate or fake, while visiting a place. The results show that a landmark being located outside of Bar Harbor has a negative and statistically significant impact on cruise passengers indicating that they walked past it while in town. The other results are qualitatively similar to those reported in table 2, with the exceptions of the estimated coefficients and marginal effects corresponding with the “street scene” and image “close-up” variables. Whereas a photo of an actual street scene in Bar Harbor has a positive and statistically significant effect on a visitor, indicating that they walked past the landmark while in town, this photo content attribute has no effect on a person’s recall when landmarks from outside of Bar Harbor are included in the analysis.¹² Likewise, the image characteristic attribute of a close-up photo has a positive and statistically significant effect on a person’s recall in the analysis of actual landmarks, but no effect when landmarks from outside of Bar Harbor are included.

5. SUMMARY AND CONCLUSIONS

Pictures reveal a lot of information about regions and places. On a large scale, aerial photographs and satellite images show changes in land use and settlement patterns, which are important to the study of regions. At a more intimate scale, pictures of specific locations and scenes can tell us where people have been, as well as how they perceive a place. This paper used small-scale images to examine the characteristics that influence the memorability of different types of landmarks. By focusing on cruise passengers, who are in a port-of-call for a limited amount of time and arrive at a specific point of entry (and using information from several survey questions to identify the parts of town that they explored), we have a

¹¹By comparison, as noted earlier in the paper, 5.3 percent and 15.5 percent of study participants mistakenly attributed pictures from different places to Macau and Taiwan, respectively (Cheng and Kuo, 2015).

¹²The particular street scene from outside of Bar Harbor is an alleyway from the United Kingdom pavilion at Walt Disney World’s Epcot theme park.

Table 3: Effects of Photo Content and Image Characteristics on Cruise Passengers Indicating that they Walked Past Landmarks Located In and Outside of Bar Harbor: Logit Regression Results

Variable	Estimated Coefficients		Marginal Effects	
Constant	0.18	(1.33)		
Sign	-0.58	(0.27) **	-0.12	(0.05) **
Retail	1.48	(0.31) ***	0.29	(0.06) ***
Restaurant/Bar	1.16	(0.29) ***	0.23	(0.06) ***
Street Scene	0.25	(0.32)	0.05	(0.06)
Ocean	1.07	(0.26) ***	0.21	(0.05) ***
Architectural Element	0.94	(0.35) ***	0.19	(0.07) ***
Clock	1.54	(0.34) ***	0.31	(0.07) ***
Fake landmark	-1.60	(0.23) ***	-0.32	(0.04) ***
Center Cell	-0.26	(0.22)	-0.05	(0.04)
Closeup	0.32	(0.29)	0.06	(0.06)
One Element	-0.49	(0.21) **	-0.10	(0.04) **
Passenger Age	-0.01	(0.005) **	-0.003	(0.001) **
Time Spent in Port	0.06	(0.04)	0.01	(0.01)
Three or More Museums in the Streets Signs	0.51	(0.14) ***	0.10	(0.03) ***
First Visit to Bar Harbor	-0.17	(0.13)	-0.03	(0.03)
Friday, Saturday or Sunday	-0.40	(0.16) **	-0.08	(0.03) **
Temperature	0.004	(0.02)	0.001	(0.003)
Cloudy Skies	0.02	(0.27)	0.004	(0.05)
Rain	-0.18	(0.27)	-0.03	(0.05)
June	-0.73	(0.38) *	-0.15	(0.07) *
July	-0.25	(0.34)	-0.05	(0.07)
August	-0.66	(0.38) *	-0.13	(0.08) *
September	-0.73	(0.41) *	-0.15	(0.08) *
October	-0.4	(0.28)	-0.08	(0.06)
Log Likelihood			-818.2	
Number of Observations			1414	

Notes: Standard errors are shown in parentheses. The superscripts ***, ** and * indicate statistical significance at the 1-percent, 5-percent and 10-percent levels, respectively.

reasonably strong framework to learn more about a visitor's memory of landmarks that they (likely) walked past.

The empirical analysis reveals several important findings related to the characteristics that are memorable about a place. We find that 48 percent of the survey respondents indicated that they saw a landmark, which they are believed to have walked past, while visiting Bar Harbor. This suggests that about one-half of the visitors remember images of a place, even after spending a relatively short time in the area. Although it's possible that some of these respondents did not see a landmark and mistakenly circled a photo on the survey, the fact that only 12 percent of those receiving surveys with "fake" images circled the picture means that visitors with "real" images are about four times more likely to indicate seeing them. An image from, say, a church located in Sweden or a retail store in Sarasota, Florida,

might spark a vague recollection of a place in Bar Harbor, but only a small percentage of respondents with those options on their surveys mistakenly indicated that they walked past these landmarks while in town.

The regression results show that a mix of salient features and unique characteristics of a place increases a visitor's likelihood of remembering a landmark. For cruise passengers visiting Bar Harbor, the most salient features of their time in port are the ocean, which defines their overall vacation and how they arrived in the region, and the retail and eating/drinking establishments that many passengers check out while in port. In addition to these characteristics that are particularly important to a cruise passenger's visit to a port-of-call, the analysis shows that some more unique details of a place—e.g., images of clocks and architectural features—increase the likelihood of a visitor remembering a landmark. Whereas people remember seeing retail and eating and drinking “places”, they do not necessarily recall the signs in front of these buildings. Other results show a negative relationship between a passenger indicating that they saw a landmark that they walked past and age, which suggests that younger people may be more observant of their surroundings. Likewise, we find that passengers who visit Bar Harbor on a weekend, when crowds are typically larger, are less likely to recall walking past a landmark. Passengers who read at least three “Museum in the Streets” signs, which may be an indicator of interest in learning more about Bar Harbor, are more likely to recall walking past a landmark.

The methods and approach presented in this paper can be used to inform regional tourism policy and planning. Ooi (2013) notes that effective tourism policy must satisfy the three requirements of (1) inclusivity and support of a broad range of stakeholders, (2) a balance between receiving the benefits of tourists while minimizing the costs, and (3) promoting and protecting the “uniqueness and authenticity of the destination”. Related to Ooi (2013) requirement of promoting a destination's uniqueness and authenticity, the results of this study suggest that photographs can be used to learn the unique and authentic aspects of places that are memorable to tourists.

Although our study focused on visitors to a region, photographs might also be used in community activities that bring together the views of diverse local stakeholders—i.e., Ooi (2013) inclusivity requirement for regional tourism policy. Farsari et al. (2011) and Stevenson et al. (2008) describe the complex nature of tourism policy-making, with an emphasis on the importance of communication and negotiation among local stakeholder groups. As a visual form of communication, local photographs can be used in community surveys, stakeholder meetings, and key informant interviews to help policymakers and tourism planners gain a broader perspective of how local stakeholders perceive tourism (and tourism landmarks/assets) and the impacts of visitors. For example, a community exercise of asking local stakeholders to rate the images that they *think* are memorable to tourists—and comparing these perceptions of locals to the photographs that are, in fact, memorable to tourists—can be used as a policy tool to determine whether the views of local stakeholders are in sync with tourists.

The study findings suggest that photos can also be used as an important component of regional and community efforts aimed at tourism development. Community and tourism promotion agencies can use photos to convey salient and unique aspects of a place to prospective guests as well as tourists while in an area. For example, destinations can strategically place

photographs on websites, marketing materials, visitor maps and signs to help build a unique identity by highlighting the most memorable aspects of a place. Similarly, destinations and tourism businesses can use photographs when interacting with tourists who recently visited a place. Our result that tourists, even cruise passengers who are in a place for less than one day, recall certain images suggests that selected photographs can be inserted into “post-visit” marketing materials to reinforce an area’s unique features and promote repeat visitation.

The methods from this study can be employed, with some modifications, in other places to examine the behavior and perceptions of tourists and, more generally, photographs can be used to learn about how people interact with the places around them. Attitudes about a variety of topics and issues can be probed using pictures on surveys or images in a laboratory setting, and we can also learn a lot about places by examining the types of photos that are shared on social media. When used along with other sources of information and data collected about people and places, pictures can truly be “worth a thousand words”.

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A. APPENDIX A: SURVEY INSTRUMENT

NAME OF SHIP: _____

Q1. Approximately what time did you get off the ship? _____

Q2. Approximately what time did you re-board the ship? _____

Q3. Before this trip, had you ever visited Acadia National Park (e.g., Cadillac Mountain, Thunder Hole, Sand Beach, Sieur de Monts Spring)? Yes NoQ4. During this trip, did you visit Acadia National Park? Yes NoQ5. Did you take a cruise-line sponsored tour? Yes No

If yes, what tour did you take? _____

If you took a tour, did you also shop in Bar Harbor? Yes NoIf you took a tour, did you also eat in Bar Harbor? Yes NoQ6. Did you have enough time to see all you wanted in Bar Harbor? Yes No

If no, how much more time would you need? _____

Q7. Did you ride the Island Explorer (i.e., free bus service)? Yes NoQ8. Did you take a walk along the shore path? Yes No

Q9. How many “Museum in the Streets” signs did you read?

 Zero 1 or 2 3 to 5 More than 5

Q10. How often did you use the point-of-interest (i.e., wayfinder) signs?

 Never 1 or 2 times 3 to 5 times More than 5 times

The next few questions ask about the money that you and others in your group (e.g., family, traveling companion) spent, and the stores and restaurants that you visited. Please do not include money paid to the cruise line for a tour.

Q11. Spending on...	Meals and drinks:	\$_____
	Souvenirs (e.g., magnet, lighthouse):	\$_____
	Clothing:	\$_____
	Art and jewelry:	\$_____
	Groceries and pharmacy items:	\$_____
	Home furnishings:	\$_____
	Books and paper goods:	\$_____
	Recreation and transportation: (e.g., admissions, taxis)	\$_____
	Other: _____	\$_____
	Total Spending:	\$_____

Q12. How many people are covered by the spending reported above? _____

Q13. About how much money did you expect your group to spend? \$_____

Q14. About how many stores and restaurants/bars did you visit? _____

Q15. In about how many stores and restaurants/bars did you spend money? _____

Q16. Please list the names of a few stores and restaurants/bars that you visited.

Q17. Did a luggage restriction affect how much you purchased? Yes No

Q18. Did you purchase any goods that you had shipped? Yes No

Q19. Please list any goods or services that you would like to have purchased, but were unable to find, in Bar Harbor.

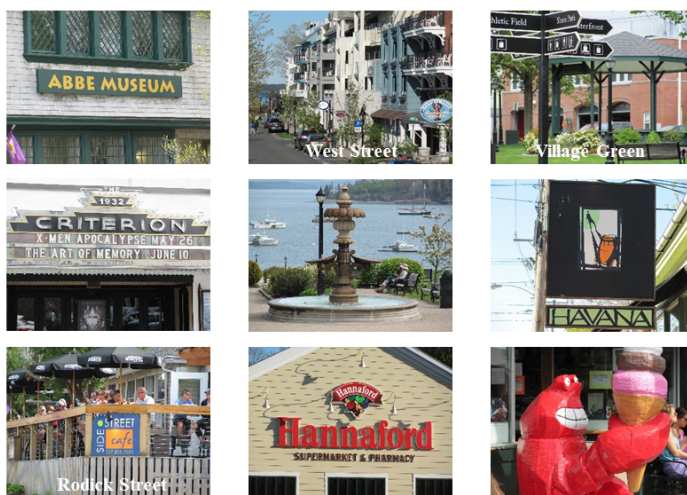
Q20. Did you look at any Bar Harbor brochures or marketing materials before you arrived?

Yes No

If yes, to what extent did they affect where you shopped and ate?

No effect Small effect Moderate effect Large effect

Q21. Please circle the pictures below if you walked past these places in Bar Harbor.



I did not walk past any of these places

Q22. How important was the stop in Bar Harbor to the cruise you selected?

Not important Moderately important It's the main reason I selected this cruise

Q23. Did you fly or drive to your port of embarkation? Fly Drive Other

Q24. Including this trip, how many cruise vacations have you taken? _____

Q25. Including this trip, how many times have you visited Bar Harbor? _____

Q26. Do you plan to return to Bar Harbor within the next two years? Yes No

Q27. Will you travel elsewhere in Maine within the next two years? Yes No

Q28. For each of the four choices below, please select the option that best describes you:

- | | | |
|---|------------------|--|
| <input type="checkbox"/> Travel alone or in a small group | <u>OR</u> | <input type="checkbox"/> Travel with a large group |
| <input type="checkbox"/> Follow a plan of sights to see | <u>OR</u> | <input type="checkbox"/> Explore with no plan |
| <input type="checkbox"/> Read about sites to see | <u>OR</u> | <input type="checkbox"/> Talk to others about sites to see |
| <input type="checkbox"/> Printed materials (e.g., books) | <u>OR</u> | <input type="checkbox"/> Online sources (e.g., Facebook, websites) |

Q29. What is your gender and age? Female Male _____Years Old

Q30. What is your highest level of education?

- | | | |
|--|--|--|
| <input type="checkbox"/> Less than high school | <input type="checkbox"/> High school diploma | <input type="checkbox"/> 2-year college degree |
| <input type="checkbox"/> 4-year college degree | <input type="checkbox"/> MA/MS degree | <input type="checkbox"/> Ph.D. / professional degree |

Q31. What is your annual household income (in U.S. dollars)?

- | | | |
|---|---|---|
| <input type="checkbox"/> Less than \$25,000 | <input type="checkbox"/> \$25,000 to \$49,999 | <input type="checkbox"/> \$50,000 to \$74,999 |
| <input type="checkbox"/> \$75,000 to \$99,999 | <input type="checkbox"/> \$100,000 to \$150,000 | <input type="checkbox"/> More than \$150,000 |

Q32. Where are you from? _____ (city, state, country)

Comments about Bar Harbor:
