Destination image in virtual social networks*

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Abstract

Since destination image is an important construct for tourism research, cities and regions try to understand and to develop a positive image in order to guarantee the number of visitors and the tourism revenue. The main objective of this article was to develop a model of evaluation of destination image through the use of pictures shared in virtual social networks. We propose that the image of a destination can be analyzed through the way tourists picture the destination in virtual social networks. Hence, we have developed a measurement to evaluate destination image based on pictures posted on Instagram, and we made a model to analyze destination image based on pictures shared in virtual social network. Our method was composed by an analysis of 1,500 pictures of three important destinations in Brazil (Foz do Iguaçú, Rio de Janeiro, and Salvador). Our results contribute to tourism research by indicating that it is possible to determine the main characteristics of a destination by the pictures in virtual social networks, and by providing a 5-dimension model to do so. This study contributes to tourism research in two venues. First, we propose a method for evaluating destination image based on pictures posted in social media rather than the usual questionnaires. This may help scholars by providing an alternative way of evaluating destination image without recall, social desirability and non-response bias. And secondly, this study also contributes to practitioners and public policy in tourism by showing which characteristics of a destination image are more prominent to the destination image, based on virtual social networks.

Keywords: cultural tourism; urban areas; leisure; image formation; photography; tourism research; marketing techniques; virtual social networks.

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Imagen de destino en redes sociales virtuales

Resumen

Dado que la imagen de destino es una construcción importante para la investigación turística, las ciudades y regiones intentan entender y desarrollar una imagen positiva para garantizar el número de visitantes y los ingresos del turismo. El objetivo principal de este artículo es desarrollar un modelo de evaluación de la imagen de destino mediante el uso de imágenes compartidas en redes sociales virtuales. Proponemos que la imagen de un destino se pueda analizar a través de la forma en que los turistas representan el destino en las redes sociales virtuales. Por lo tanto, desarrollamos una medida para evaluar la imagen de destino basada en imágenes publicadas en Instagram y desarrollamos un modelo para analizar la imagen de destino basada en imágenes compartidas en una red social virtual. Nuestro método fue compuesto por un análisis de 1500 imágenes de tres destinos importantes en Brasil (Foz do Iguaçú, Río de Janeiro y Salvador). Nuestros resultados contribuyen a la investigación turística en tanto indican que es posible determinar las características principales de un destino por las imágenes en las redes sociales virtuales, y proporcionan un modelo de cinco dimensiones para hacerlo. Este estudio contribuye a la investigación turística en dos espacios. Por un lado, proponemos un método para evaluar la imagen de destino basada en imágenes publicadas en las redes sociales en lugar de los cuestionarios habituales; esto puede ayudar a los académicos al proporcionar una forma alternativa de evaluar la imagen de destino sin recordar la conveniencia social y el sesgo de no respuesta. Y por otro lado, este estudio también resulta provechoso para los profesionales y las políticas públicas en turismo al mostrar qué características de una imagen de destino son más prominentes a la imagen de destino basada en redes sociales virtuales.

P*alabras clave*: turismo; ciudades; ocio; formación de la imagen; fotografía; investigación en turismo; técnicas de *marketing*, redes sociales virtuales.

Imagem de destino em redes sociais virtuais

Resumo

Como a imagem de destino é um importante construto para a pesquisa em turismo, as cidades e regiões tentam desenvolver uma imagem positiva para garantir o número de visitantes e a receita. O objetivo deste artigo é desenvolver um modelo de avaliação de imagem de destino através do uso de imagens compartilhadas em redes sociais virtuais. Propomos que a imagem de um destino possa ser analisada pela maneira como os turistas imaginam o destino em redes sociais virtuais. Assim, desenvolvemos uma medida para avaliar a imagem de destino com base em fotos publicadas no Instagram. Nosso método foi composto por uma análise de 1500 fotos de três importantes destinos no Brasil (Foz do Iguaçu, Rio de Janeiro e Salvador). Nossos resultados contribuem para a pesquisa em turismo, indicando que é possível determinar as principais características de um destino pelas imagens em redes sociais virtuais e fornecendo um modelo de 5 dimensões para fazê-lo. Este estudo contribui para a pesquisa em turismo em dois locais: propomos um método para avaliar a imagem de destino com base em imagens postadas em mídias sociais, em vez dos questionários usuais. Isso pode ajudar os estudiosos, fornecendo uma maneira alternativa de avaliar a imagem de destino sem recordação, desejo social e viés de não-resposta. Este estudo também contribui para os profissionais e políticas públicas em turismo, mostrando quais características de uma imagem de destino são mais proeminentes para a imagem de destino com base em redes sociais virtuais.

P*alavras-chave*: turismo; cidades; lazer; formação de imagens; fotografia; investigação em turismo; técnicas de marketing; redes sociais.

Introduction

Destination image is one of the key elements that influences tourists when deciding where to travel to (Baloglu & McCleary, 1999). Researchers have dedicated extended research in tourism in order to better understand and measure the attributes of destination image (Echtner & Richie, 1993), and more recently, a growing amount of research into investigating how tourism is related to virtual social networks (Zeng & Gerritzen, 2014). However, many of these efforts are based on the perspective of the people involved with those destinations (visitors, consumers, students) relying on surveys and scales to measure attributes of a given destination (Pike, 2002). In this study, we propose that it is possible to analyze the image of a destination by using pictures shared in virtual social networks, specifically, on Instagram.

A number of scholars have already studied destination image, analyzing country (Reisenger & Turner, 2000; Chaudary, 2000), state or province images (Yannopoulos & Rotenberg, 1999; Pritchard & Walkup, 2000), and specific destinations as cities (Murphy, Pritchard & Smith, 2000) and resorts (Andreu, Bigne & Cooper, 2000). Destination image is regarded as an attitudinal construct formed by perceptual and cognitive, affective, and global factors (Baloglu & McCleary, 1999). Current research is focused towards analyzing aspects that link behavior and use of social media, and destination image (Zeng & Gerritzen, 2014). As an attitudinal construct, it is possible to measure destination image using attitudes of the visitors. As Hunter (2016) showed, destination image can be assessed by analyzing images of a destination that are available on the internet; hence, it is possible to systematize and develop a quantitative scale for analyzing destination image based on pictures shared in virtual social networks.

The possibility of analyzing destination image without using a survey is important for studies in tourism and destination image. Extant literature on destination image has difficulties in operational rigor (Kock, Josiassen, & Assaf, 2016). Additionally, surveys have a number of biases: Nonresponse (Armstrong & Overton, 1977), social desirability (Fisher, 1993) and recall biases (Tarrant & Manfredo, 1993) may interfere with the purity of the results. Hence in this study, we use the attitudes of the visitors to measure aspects of destination image. Specifically, we seek to develop a measurement of destination image that does not rely on questionnaires, but in pictures shared in virtual social media. This is not the first study to analyze destination image by using pictures: As Hunter (2016), has shown, it is possible to assess destination image by using qualitative analyses of images online. Our study, on the other hand, develops a systematic method and generates a scale in order to analyze destination image with pictures posted on virtual social networks. The main objective of this study is to develop a model of evaluation of destination image through the use of pictures shared in virtual social networks.

Methodologically, we based our constructs in the classical work of Baloglu and McCleary (1999). We transformed the Baloglu and McCleary (1999) scale into measurements of the destination image and evaluated the presence of the items in the scale in a sample

of 1,500 pictures shared on Instagram by visitors of three large destinations in Brazil: Foz do Iguaçu, Rio de Janeiro and Salvador. We then used a factor analysis in order to develop the constructs for our picture-based measurement of the destination image. We later use confirmatory factor analyses in order to develop a model of destination image detectable in virtual social networks.

Virtual social networks are used by a good part of the population to share information about their experiences and to search for information and knowledge. According to Munar and Jacobsen (2014), a few years ago someone's experiences were shared only within their circles of friends, today, these experiences are exposed on a global network of information, with the possibility of being analyzed by companies and organizations.

The tourism industry has undergone significant changes due to virtual social networks, especially when it comes to the ease of exchanging information over the internet, as well as the possibility of buying tickets and lodging rates. The internet has become of great help for users to make their own choices using the autonomy developed through the internet and virtual social networks. It is possible to search the opinions of other tourists who have already been published on the internet (Leung, Law, Van Hoof & Buhalis; Jacobsen & Munar, 2014; Cabiddu, De Carlo & Piccoli, 2014; Wang, Huang, Li & Peng, 2016; Yoo & Gretzel, 2016).

The Brazilian Media Survey (2015) shows that 83% of Brazilians with Internet access have an account in a social network, and it is also listed as the main vehicle for information consumption. This makes these websites a laboratory full of communicational habits to be monitored. Moreover, they are a platform that provides a large volume of information, considered powerful to generate decisions based on data intelligence in different areas (Zandavalle, 2016).

Literature review

Destination image is one of the most important features of a touristic destination because it comprehends the subjective perception and subsequent behavior of tourists (Gallarza et al., 2002). Subsequently, the image of a destination acts similarly as brand image, but regarding a destination (Pan & Li, 2011). Hence, destination image is an important attribute for researchers and practitioners to understand the attitudes of tourists towards a specific destination (Beerli & Martin, 2004).

There are two important approaches for a destination to develop its image. The first one is static, with the studies of the relationship between destination image and the behavior of tourists; the second one, dynamic, that is directed towards understanding the image of destinations and their changes (Gallarza et al., 2002; Viol, Todd, Theodoraki & Anastasiadou, 2018).

There are several factors that influence destination image. Some of these influencing factors are sources of information, previous perceptions, the time of the evaluations, mo-

tivation, accumulated touristic experiences and sociodemographic characteristics (Beerli & Martin, 2004). As all these factors are highly personal, it is possible to conclude that destination image is a highly personal construct (Gallarza et al., 2002), thus each person will have a distinct image of a destination.

The development of a positive destination image is important for government agencies, practitioners and for stakeholders of tourism. Destination image will influence the will of a tourist to recommend a destination he or she has been to, as well as loyalty and the possibility of returning to that place (Dwyer et al., 2009; Martín-Santana, Beerli-Palacio & Nazzareno, 2016). As the image of a destination may be influenced by the internet (Oliveira & Panyik, 2015).

Although destination image is a very personal construct (Gallarza et al., 2002), it is possible to influence the way people perceive the image of a destination by using marketing techniques (Pan & Li, 2011). These techniques depend highly of the measurements of the destination image, in order to know the factors that compose it and how the destination positions itself in relation to each of these factors (Beerli & Martin, 2004). Hence, firms, governments, agencies and other stakeholders of the tourism agency have interest in the understanding and development of a destination's image Baloglu e McCleary (1999). There are relevant critics to the current constructs that analyze destination image. One of the main argument used by researchers to criticize the current models is that they are majorly atheoretical and that they lack operational rigor (Kock et al., 2016).

The use of online surveys and analyses of online content has been trending in tourism research (Hunter, 2016). The combination of the analyses of a destination image with the use of virtual spaces to assess this image has resulted in a new construct, sometimes referred as a virtual destination image (Govers et al., 2007). Hence, it is important to evaluate the online aspects of a destination when assessing its image.

Virtual social networks (also referred to as Social Media) have been increasingly popular over the years, and tourism has walked hand in hand with virtual social networks since their beginning. In fact, the use of social media in tourism is a growing topic for researchers (Zeng & Gerritzen, 2014). The interest of tourism researchers in virtual social networks and social media is so great that it can be considered one of the major trends of the area (Leung et al. 2013). The possibility of showing the world (or a community of friends) one's travel pictures, experiences and opinions has been a popular use of virtual social networks (Amaro et al., 2016). The interactions that take place in these networks are important for destination image because they compose information sources, which are determinants for destination image (Baloglu & McClearly, 1999). The behavior of tourists online is also visible in websites as Tripadvisor, Expedia, and Yelp as important sources of information for people planning travels (Xiang, Du, Ma, & Fan, 2017).

Tourists will share images in virtual social networks for many reasons. One of the most important motivations for sharing images in virtual social networks is self-representation: In other words, tourists seek to associate themselves with images posted, hence posting

pictures of themselves in destinations that they want to be related with (Lyu, 2016). It is important to understand the use of these images by tourists because it may be a way of understanding them (Hofacker & Belanche, 2016).

The internet can be a source of information to evaluate destination image. As Hunter (2016) proposes, semiotic analyses can be conducted in images found on the internet in order to assess the image of a destination with relatively good accuracy. The relationship between the internet and tourism is of great interest to practitioners, since the behavior of tourists can be influenced by internet and social media (Hofacker & Belanche, 2016). The link between the internet and destination image becomes even more important when we consider that with the use of the internet, it is possible not only to assess destination image, but also to influence it (Oliveira & Panyik, 2015).

Destination Image

In a study conducted in Australia by Leal (2004), combining qualitative and quantitative techniques, the qualitative results pointed out that the main characteristic of national tourism in the country is its culture-centered nature, while the quantitative data presented six new factors of analysis: Reputation, attractiveness, and locations; Infrastructure and facility; Natural environment, opportunity to gain knowledge and adventure; Good prices, entertainment, and festivals; Gastronomy, restaurants, and accommodation; Developed and attractive cities.

Rezende-Parker, Morrison and Ismail (2003) conducted their study in the United States, with a questionnaire applied online. This study found similarities with that of Leal (2004), since the responses were also related to themes such as environment and festivities, and lack of personal security. Quantitative research found 8 factors, which were named as follows: Natural attractions and interest; safety and comfort; cultural comparisons; facilities and information; holiday atmosphere and exotic; economic and social condition; transportation, and adventure and learning.

Within the same theme, qualitative studies such as the one by Chagas (2008) had an objective: to review and discuss the specific literature on destination image, nationally and internationally, for the purpose of contributing to the development of future research on the subject. The review carried out by Chagas (2008) contemplated the central theme (destination image), its concepts, components and dimensions, as well as the formation of the image of destiny. The researcher made a survey of the evaluations and measurements of the target image performed until that moment, and identified that the image can undergo changes over time, also highlighting the role of the community when it comes to forming the image of a destination. According to the study, there are some types of image: Too attractive, positive / attractive, constructive, poor / weak, neutral, negative / repulsive, mixed, stereotyped, and distorted / confused. Some theoretical gaps have been identified, mainly in the Brazilian studies, to the construct of other world tourist destinations.

Santana and Marlusa (2017) performed a hypothetical model about destination image. The objective of their research was to analyze target image formation models, aiming at proposing a hypothetical model that contemplates from the relations between the dimensions of the target image (cognitive, affective, single, and global), the influence of external and internal factors (informational, experiential familiarity, sociodemographic characteristics and motivations), to the influence of the target image on behavioral intentions (feedback and recommendation). The proposed model resulted in the compilation of eleven hypotheses. Through the results, the authors portrayed the complexity of the target image construct, both in relation to the multiple factors that compose it and the number of predicted relations. With the relationships that were found, it was possible to verify the direct and indirect influences from the mediating roles of the dimensions. In addition to proposing a target image model, the authors also discussed a wide range of existing models.

Method

To develop the picture-based method of evaluating destination image, we first gathered a number of characteristics that were used in surveys to evaluate destination image. The items of the evaluated characteristics were based on the questionnaire of Baloglu and McCleary (1999), with small changes. The use of Baloglu and McCleary (1999) is adequate because their seminal scale has been largely used in tourism research to evaluate destination image, based on the opinion of the interviewee. The use of pictures posted online is valid for assessing destination image, as shown by Hunter (2016).

The choice of Instagram as the social network for the study was due to the fact that it is the most used photo-based virtual social network. Other possible option would be Facebook, although as it is not as picture-centered as Instagram, we decided to use the latter. Instagram currently has one billion registered users (Price, 2018), being the largest social network whose main goal is only photo sharing.

In this study, we used a sample of 1,500 pictures posted to Instagram indicating the locations of three Brazilian cities that are large destinations: Rio de Janeiro, Foz do Iguaçú, and Salvador. We selected a total of 500 pictures from each destination, and used the location tool of Instagram to search only for the pictures taken in our target destinations. We selected random pictures posted on Instagram over one month before, and we used a social media monitoring software (Seekr) in order to retrieve the images within these criteria.

A team of three evaluators, whose members are researchers of tourism other than the authors, evaluated the pictures; hence, each picture was evaluated three times, by three different specialists, to ensure an unbiased method. This implicated that each specialist evaluated all of the pictures. Coding each of the items adapted from Baloglu and McCleary (1999) was done as the following: 1 if the item was present and positive, 0 for when the characteristic was absent or did not apply, and -1 when the picture showed the complete opposite. For instance, in the item "Large groups of people", if there was a large group

of people, it was coded 1, and if there was not, the specialist coded 0; or in the item "a non-polluted place", the specialist would code a 1 for a clean, non-polluted place, and -1 when there was pollution in the picture. We used the mean of the results of the three specialists' analyses. We also gathered data on the number of "likes" the picture had, and the number of "followers" the account that posted the picture had. The list of items evaluated is presented at Table 1.

Table 1. Variables

Item	*Present*	*Absent*	*Contrary*
Interesting cultural attractions	1	0	-1
Interesting historical Attractions	1	0	-1
Natural attractions	1	0	-1
People having fun	1	0	-1
People finding thrills and excitement	1	0	-1
People being adventurous	1	0	-1
People learning new things	1	0	-1
People experiencing a different culture	1	0	-1
Interesting cultural activities	1	0	-1
Historic or extraordinary places	1	0	-1
Ostentation	1	0	-1
An attempt to look good for friends	1	0	-1
Expensive items	1	0	-1
Escaping from routine	1	0	-1
Standard hygiene and cleanliness	1	0	-1
Quality infrastructure	1	0	-1
A safe environment	1	0	-1
Good nightlife and entertainment	1	0	-1
Local cuisine	1	0	-1
Beaches/watersports	1	0	-1
Friendly locals	1	0	-1
Relieving stress and tension	1	0	-1
Relaxing physically	1	0	-1

Item	Present	Absent	Contrary
Relaxing mentally	1	0	-1
Getting away from demands of everyday life	1	0	-1
Tourists meeting other tourists	1	0	-1
People with friends	1	0	-1
Large groups of people	1	0	-1
A non-polluted place	1	0	-1

Source: Adapted from Baloglu and McCleary (1999)

Results

As our initial results, we show in Table 2 the results of the factor analysis of our data. We used a Direct Oblimin rotation because it allows constructs to have a degree of correlation. Correlation is important between these variables because they exist naturally, as destinations with more natural attributes, for instance, are expected to have a higher level of escapism. Results showed that the factor analysis was significant, having a Kaiser-Meyer-Olkin score of 0.848 and a Bartlett score significant at $p < 0.000$. We excluded the variables "People away of crowds", "Adequate weather for outside activities", "Favorable weather" and "Quality hotel" because they did not reach the communality score of over 0.5 hence not being successfully measured by the method.

Results in Table 2 show that there were seven factors that resulted from the exploratory factor analysis. We labeled the first factor E*scapism*, which represents how much the tourists "get away" from their daily lives and engage in activities that are significantly different from their routines in the destination. The variables in E*scapism* are, for instance, G*etting away from demands of everyday life*, and R*elieving stress and tension*. The second factor, E*xperience*, represents the amount of joyful, interesting and exciting experiences that tourists have in the destination. Variables in the experience factor follow the likes of P*eople experiencing a different culture*, and P*eople being adventurous*. Our third factor is I*nfrastructure* which accounts for the amount of quality infrastructure that the destination presents; the variables in this factor are, for instance, A *safe environment*, and S*tandard hygiene and cleanliness*. The E*ntertainment* factor represents the amount of entertainment and nightlife of the destination, and it was composed by variables as G*ood* N*ightlife*, and E*ntertainment* and L*ocal cuisine*. The fifth factor was labeled S*ocial*, and it represents the amount of social contact that the destination promotes; it contained variables as T*ourists meeting other tourists*, and L*arge groups of people*. The sixth factor, N*ature*, accounts for the amount of nature that the destination shows, with the variables B*eaches/watersports* and N*atural attractions*. The last factor, F*un*, was composed by variables as F*riendly locals*, and P*eople having fun*; it seeks to represent the amount of fun the destination shows.

Table 2. Factor analysis

	Construct						
Attribute	*Escapism*	*Experience*	*Infrastructure*	*Entertainment*	*Social*	*Nature*	*Fun*
Relaxing mentally	.912						
Relieving stress and tension	.908						
Getting away from demands of everyday life	.880						
Relaxing physically	.816						
Escaping from routine	.627						
Ostentation	.509						
Interesting cultural activities		.853					
Historic or extraordinary places		.824					
Interesting cultural attractions		.804					
People experiencing a different culture		.753					
Finding thrills and excitement		.738					
People being adventurous		.681					
Interesting Historical Attractions		.619					
People learning new things		.533					
Quality infrastructure			.919				
A safe environment			.875				
Standard hygiene and cleanliness			.860				
A non-polluted place			.693				
Expensive items				.772			
Good Nightlife and Entertainment				.718			
Local cuisine				.700			
Tourists meeting other tourists					.788		
Large groups of people					.761		
People with friends					.721		
Beaches/watersports						.888	
Natural attractions						.816	
Friendly locals							.803
People having fun							.621
An attempt to look good for friends							.608

Source: Prepared by the authors.

Figure 1 shows the first model of destination image that we drawn, using the Destination Image as a second order construct to assess how each of our factors would influence the whole construct. Our model was configured to hold all constructs resulting from the factor analysis.

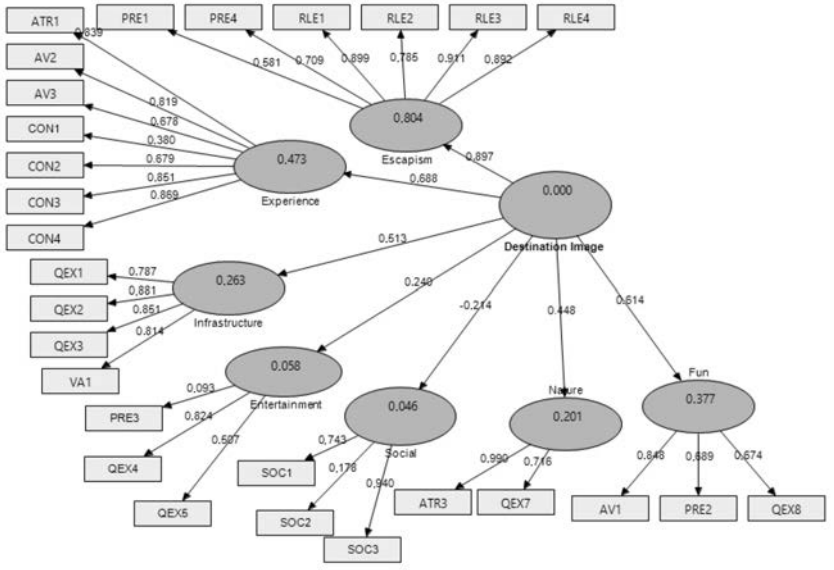

Figure 1. Initial Model
Source: Prepared by the authors.

As the E*ntertainment* construct did not have good standards of validity (AVE < 0.5), we decided to drop the construct E*ntertainment*. We also removed variable CON1 ("People learning new things") in order to raise the AVE of the E*xperience* construct. The final model is presented in figure 2. We removed the S*ocial* construct because there were no significant relations between it and the second-order construct D*estination* I*mage* detected in a bootstrap test, thus, indicating that the *social* aspect is not adequate for analyzing destination image using the picture in social media method.

Table 3 summarizes the quality criteria of the final model. As it can be seen in Table 3, the AVE (Average Variation Explained) of each variable was higher than 0.5 (as recommended by Henseler, Ringle & Sinkovics, 2009). This result shows that the average variation explained of the constructs is adequate, hence they all will have variables that are important for their formation. Composite reliability was also adequate, following the recommendations of Hair et al. (2014), being higher than 0.7 for all constructs. We also checked for internal reliability of the constructs using Cronbach's Alpha. Every alpha score was higher than the 0.7 value recommended by Hair et al. (2014) except for the F*un* construct. The F*un* construct did not reach 0.7 as instructed by Hair et al. (2014), but it did reach the composite reliability and AVE. The construct also had 0.62 of alpha

score, hence, we decided to keep it at the model regardless of a smaller than ideal alpha, because the low alpha may be a result of a low number of observed variables in that construct.

Table 3. Quality criteria

	AVE	*Composite reliability*	*Cronbach's alpha*
Escapism	0.648	0.915	0.885
Experience	0.630	0.910	0.882
Fun	0.543	0.778	0.624
Infrastructure	0.691	0.899	0.863
Nature	0.751	0.855	0.759

Source: Prepared by the authors.

We used the Fornell-Larcker criteria to test for possible collinearity between latent variables, due to high correlations. The results of the Fornell-Larcker test are shown in Table 4. As it can be seen in that table, there were no problems regarding the latent variable correlations, since every correlation was lower than the square root of the AVE of the constructs, following the standards of Fornell-Larcker criteria.

Table 4. Latent variable correlations*

	Escapism	*Experience*	*Fun*	*Infrastructure*	*Nature*
Escapism	**0.805**				
Experience	0.391	**0.794**			
Fun	0.618	0.145	**0.737**		
Infrastructure	0.339	0.182	0.277	**0.831**	
Nature	0.328	0.452	0.008	0.033	**0.867**

* The numbers highlighted represent the square root of the AVE of each construct.
Source: Prepared by the authors.

In our final model (depicted in Figure 2) it is possible to observe that the *entertainment* and *social* constructs were dropped. These constructs had low fits according to the AVE criteria, and no significant relations according to the bootstrap process, respectively. It is conceptually acceptable that these constructs were dropped, because both aspects can be found in our other constructs. Specifically, aspects of entertainment and social interaction will easily be found in Escapism and Experience constructs, as these constructs are related to several aspects that influence the way people perceive their travel, including aspects of entertainment and social interaction.

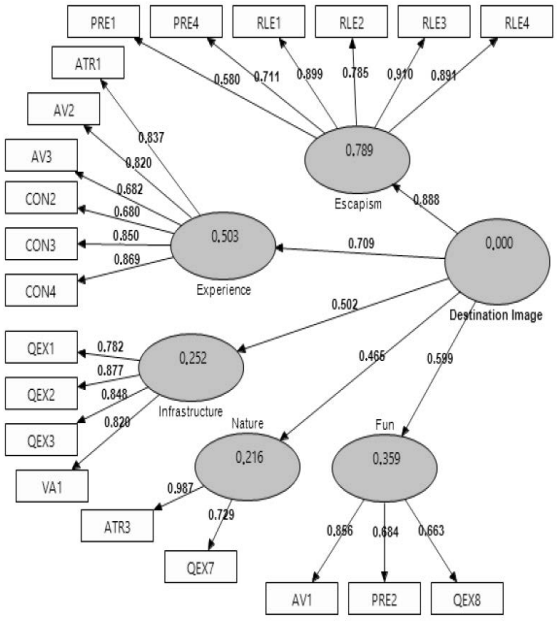

Figure 2. Final model
Source: Prepared by the authors.

We used bootstrapping tests in the final model, which resulted in every construct having a statistically significant ($t > 1.96$) correlation with the Destination Image second-order construct. The significance of every construct's relation with Destination Image indicates that the constructs developed in this paper are valid for analyzing and determining the image of a destination. As predicted in the exploratory factor analyses, the constructs E*scapism* ($\beta = 0.888$) and E*xperience* ($\beta = 0.709$) were the ones that offer more predictability over Destination Image.

We also performed blindfolding tests in order to evaluate the predictability value of our model. Results indicated an f^2 of 0.36 and a Q^2 of 0.3, which indicate that the model is valid and has high predictability. The Goodness of Fit test also resulted higher than the usually accepted standards (0.4).

Discussion

This article intended to develop a model that can make it possible to analyze destination image based on pictures posted by tourists in virtual social networks. Efforts in order to better understand the dynamics of destination image have been abundant in literature throughout the years in tourism research (Baloglu & McCleary, 1999; Reisenger & Turner, 2000; Chaudary, 2000; Pan & Li, 2011). Although well understood, destination image is a construct that relies greatly in surveys and interviews (Pike, 2002). Although the use of

surveys to evaluate the destination image of a city, region or country is very useful, it has a number of biases as recall (Tarrant & Manfredo, 1993) and social desirability ones (Fisher, 1993). Hunter (2016) showed that it is possible to analyze destination image using pictures posted online. Hence, we further develop the concept that the use of pictures posted in virtual social networks can be especially useful as a complementary method to analyze and evaluate a destination's image.

Pictures posted on virtual social networks may seem, at first glance, naïve, and just a communication between a person and their followers. But there is more than meets the eye when it comes to what these pictures represent. Scholars have recently analyzed some aspects of sharing images in virtual social networks and were able to link motivations to share images to social motivations (Lee, Lee, & Moon, 2015) and personality. Hence, this article contributes to the discussion of what can these shared images represent about what they depicture and the people that share them.

Pictures shared in virtual social networks have a strong social motivation, which is related to issues as sense of belonging and social support (Lee et al., 2015). Hence, tourists will share their experience in touristic destinations in order to achieve these social goals. This can only be done if the shared pictures have legitimacy enough by depicting the destination image according to the eyes of the tourist, since pictures that do not depict the destination as its accepted image may be doubted for lack of legitimacy. This logical explanation shows why shared virtual pictures will be good predictors for the destination image. These pictures do not only show the physical aspects of the destination, but also carry the legitimacy discourse of the destination image, as tourists will avoid posting pictures that do not adequately represent what they think of the place they are visiting.

Our results contribute to literature by showing that it is possible to evaluate destination image using the pictures shared by tourists in virtual social networks. We show that the E*scapism* and E*xperience* are the most determinant constructs in destination image represented in virtual social networks. Hence, we contribute to theory by showing that, when pictures are taken on account, the most important constructs are E*scapism* and E*xperience*. These results also contribute to practice, as practitioners, agencies and government institutions can use the resulting main constructs in order to develop their destination images in virtual social networks taking the E*scapism* and E*xperience* constructs in regard. Our research differs from Hunter (2016) because it develops a systematic method and a scale to analyze destination image by using pictures posted online.

Limitations and future research

This article has three limitations that are relevant to point out. The first one lies in the limited number of touristic destinations that were part of our sample. Regardless of the high number of pictures of each destination that were analyzed, we only took three destinations into account. Three destinations are important to triangulate the data in order

to have a more reliable model. It is important for the further development of the model to have more destinations as data, in order to guarantee reliability in different contexts. Hence, future research could delve into data of other destinations, which could contribute to theory by developing a more reliable model.

The second limitation is due to the geographic limitation of the sample, as we only used destinations in Brazil. This decision implicates in a model that may have a small bias regarding the habits of Brazilians (as most tourists in these destinations are nationals) in virtual social networks, which may be slightly different from other nations. Additionally, the very destination images in Brazil may have variations that are not seen in other countries. Hence, the model is well-adjusted to the Brazilian context, but may not be as well-fit for international use. Future research could delve into expanding the model in other countries. The international expansion of our model could contribute to theory by becoming a platform not only for analyzing destination image, but also to analyze the differences in how destination images are depicted across countries.

The third limitation has to do with the quantitative pureness of the model: Our model is purely quantitative, and hence it has no means of analyzing small aspects that are not easily detected by our method of evaluating the pictures. Hence, the model may be not sensible to issues such as pictures that criticize the destination. Further research could develop a qualitative aspect of the model, which could evaluate not only the elements in the picture, but also the comments that follow the picture. This could contribute to the evaluation of destination image as a complementary analysis to the model.

Conclusions

This paper explores the possibility of using pictures at a popular virtual social network in order to examine the destination image of cities in Brazil. Through this paper we arrive at two major conclusions. First, we conclude that it is possible that the destination image can be measured through a quantitative analysis of pictures taken at the destination. Through this contribution, future studies will be able to use the picture-based model in order to evaluate distance as an exploratory or confirmatory step. The second conclusion is that experience and escapism are the most important dimensions when we use the picture-based model for an analysis, showing that destinations that are more prone to experience-based tourism and escapism-based tourism can establish their image more easily through pictures at virtual social networks.

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