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CAN SOCIAL MEDIA BE A TOOL FOR INCREASING TOURISTS' ENVIRONMENTALLY RESPONSIBLE BEHAVIOR?

Enamul HAQUE
Burapha University, Faculty of Management and Tourism, Bangsaen, Chonburi-20131, Thailand, e-mail: bpcsagar1346@gmail.com

Tinikan SUNGSUWAN*
Burapha University, Faculty of Management and Tourism, Bangsaen, Chonburi-20131, Thailand, e-mail: look_kook@hotmail.com

Sarunya SANGLIMSUWAN
Burapha University, Faculty of Management and Tourism, Bangsaen, Chonburi-20131, Thailand, e-mail: sarunyas@go.buu.ac.th

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Abstract: For the sustainable development of a tourism destination, environmentally responsible behavior (ERB) is a vital issue. This study developed an implicated model based on the Stimulus-Organism-Response (S-O-R) framework showing the usages of social media by tourists regarded as a stimulus; environmental awareness, and place attachment generated from using social media regarded as an organism; and tourists' ERB thereby bringing behavioral intension regarded as responses. The integrated tourists' ERB model was experimentally tested using survey data from 467 Bangladeshi tourists by SEM-based methodology. The study found that social media has a beneficial effect on environmental awareness and place attachment, negatively impacting ERB. Furthermore, environmental awareness and place attachment has a favorable impact on ERB. This article discusses theoretical discoveries as well as practical consequences.

Key words: social media, environmental awareness, place attachment, ERB, Saint Martin's Island, Bangladesh

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INTRODUCTION

Tourism is often considered an essential mechanism for economic growth and development (Brida and Risso, 2009). The rapid growth of tourism sometimes has adverse environmental effects, such as increasing greenhouse gas emissions from visitors' leisure activities and needs (Dwyer et al., 2010). It has the key contribution to emit CO_2 to the world climate, especially in the low-income country's tourism industry (Haseeb and Azam, 2020) and this industry is accounted for almost one-tenth of the world's carbon emissions (Independent, 2018). Since tourism is highly reliant on a destination's natural and cultural attractions (Kiatkawsin and Han, 2017), adverse tourist effects may severely affect sustainable development (Su et al., 2018). Tourists may cause to environmental damage by disrupting wildlife (Chen, 2011), polluting (Logar, 2010), and overcrowding (Dickinson and Robbins, 2008), even flower picking (Chang, 2010). One of the main concerns of tourism scholars is environmental protection. Tourists behavior is directly involve to degrade the natural environment (Kreag, 2001), caused different type of massive environment pollution (UNEP, 2019). Destination Management Organizations are increasingly faced with severe environmental problems (Cheng and Wu, 2015; Han, 2015) due to visitors' behavior (Chang, 2010). So, it is crucial to understand the primary factors of environmentally responsible behavior (ERB). Various theories were considered to understand the mechanism behind tourists' ERB, such as planned behavior (Chen and Tung, 2014), value-belief-norm theory (Han, 2015), goal-directed behavior (Han and Hwang, 2016), and place attachment theory (Cheng and Wu, 2015). Different studies were held on tourists' ERB to explore tourists' internal drivers (Abdullah et al., 2019; Jahanishakib and Bakhshi, 2020), social and economic factors (Gifford and Nilsson, 2014; Liu and Hao, 2020), traditional education process (Bogner, 1998; Chawla and Cushing, 2007), and so on. Most of the typical studies focused on tourists' traits or social factors to find the ERB, ignoring the human internal learning process by digital platforms such as social media (SM).

We aimed to cover this gap using the well-known S-O-R framework of Mehrabian and Russell (1974). Globally, nearly 3.6 billion (49% people) use social media which will be 4.141 billion by the year 2025 (Statista, 2020). Social media are increasingly important to grow the tourist's attractions (Briciu and Briciu, 2020), impactful for overshadowing all conventional outlets (Jacobsen and Munar, 2012), and a great influencer on tourists' beliefs and behavior (Lebe et al., 2014; Sparks et al., 2013). By focusing this area, we were attempting to explore the factors and their indicators which impacts on tourists' ERB, and then develop the ERB model using SEM. A stimulus may generate an internal state (i.e., gaining awareness of nature) which influence the person's conduct. Tourists may respond to environmental stimuli by developing subjective awareness about their entire tourism experience. The consumer then chooses whether to continue using the service or not (Taha et al., 2021). Tourists are more prone to adopt social media-related habits than visitors who have less integration and knowledge of the environment (Javed et al., 2020).

* Corresponding author

The S-O-R framework helps predict consumer behavior, such as customer loyalty (Mazaheri et al., 2010). Some marketing and tourism academics have used the S-O-R framework to investigate the development of tourist behaviors, such as Su et al. (2014) revealed the importance of emotional experience in different tourism contexts. Others worked on hotel environment, which triggers hotel loyalty through emotions (Jani and Han, 2015), destinations reputation to visitors' behavior (Su et al., 2020), destination's experiences to Virtual Reality and visit intention (Kim et al., 2020).

SM marketing develops the purchasing intention (Oussa et al., 2021), substantial effect on behavioral intention and actual behavior (Javed et al., 2020) to its users. It affects increasing customer satisfaction which turns into re-purchasing (Voramontri and Klieb, 2019) and revisiting (Riera et al., 2015). Having these influences, SM is becoming more significant in the tourism sector (Javed et al., 2020). However, SM can assist speed sustainable development by increasing eco-environmental consciousness (Lively, 2011). Similarly, place attachment (PA) is vital in predicting tourists' future behavior (Cheng et al., 2013). Environmental knowledge, place attachment and sensitivity influence ERB (Cheng and Wu, 2015; Lee and Oh, 2018). Place attachment has two dimensions: identity and dependency. Oh et al. (2012) found that place identity emerged after place dependency. However, environmental awareness (EA) is the driving factor underlying environmental behavior (Mobley et al., 2010). Environmental attitude leads to pro-environmental conduct (Burgess et al., 1998). Given the significance of EA and PA, the current research focused on social media's impact on visitors' ERB. In summary, this research seeks to understand how SM, EA, and PA affect tourist ERB.

The direct contributions of the study are; first, tourists' ERB enters the model to represent response outcomes in the S-O-R framework (Figure 1). Secondly, this article integrates the S-O-R framework with script theory, using PA and EA to link the theories. Thirdly, by incorporating aspects of tourist behavioral psychology, the suggested model may enhance current consumer behavior theory and analytical frameworks. Finally, developing a new theoretical framework and platform for researching tourist's ERB origins, effects, and processes could inspire future scholars. Indirectly, by raising significant awareness to mass tourists on tourism sustainability, policymakers and destination management organizations (DMOs) may create more sustainable tourism. DMOs could build a good image using SM. The result may aid tourists and locals in better understand their environmental responsibilities. This study's S-O-R model may improve existing consumer behavior theory and analytical frameworks by integrating behavioral psychology and study aspects.

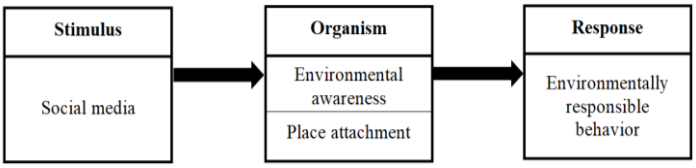

Figure 1. S-O-R model in research formed by researcher

Theoretical foundation

The Stimulus Organism Response (S-O-R) theory (Mehrabian and Russell, 1974) states that a stimulus generates a response based on an organism's internal evaluation. The internal evaluation may be conscious or unconscious. In every scenario, the internal tale drives unconscious or instinctive judgments that generate emotion and response. However, psychologically, it is possible to alter human behavior deliberately or accidentally. Following S-O-R theory, people react to the environment in two ways: approach behavior (desire to explore) or averting behavior (dislike to do anything positive). This approach focuses on the mental or emotional aspects of the environment, called aesthetic incitements (Wohlwill, 1976). Jacoby (2002) proposed an integrated S-O-R framework with cognitive and emotional structure. Kim and Lennon (2013) used the sources (external-internal) of information as stimuli to influence customers' intentions (responses) through cognition and emotions (organism). Following the S-O-R framework, the actual theme park visitors' physical (hedonic and utilitarian values) experiences (Chang et al., 2014), the desire of travel and actual visits of travelers (Rajaguru, 2014) is explored. Recently, the S-O-R model has been applied in the hotel service consuming context (Jani and Han, 2015), on tourist perception to tourist ERB (Su et al., 2020), on tourist's experiences, reaction, and visiting intention (Kim et al., 2020). Following S-O-R framework, this study proposed that using SM (Stimuli) develop EA and empower PA (Organism) which lead tourists' ERB (Response).

LITERATURE REVIEW AND HYPOTHESIS BUILDING

Stimuli: social media (SM) and its usages

Social media are web-based platforms where people may interact, share information, and exchange ideas (Dollarhide, 2020). SM is a set of tools and resources that allow people to generate and share knowledge (Boyd, 2010). Because of the influence of SM in tourism, travel intent and purpose have impacted visitor behavior (Zeng and Gerritsen, 2014). The high use of SM by young tourists (Crowdriff, 2020) profoundly affects them (Chatzigeorgiou, 2017). Using social media/networks, tourists become co-producers, co-marketers, and co-consumers of tourism (Fotis, 2015). Tourism satisfaction (Huang et al., 2017), tourist decision (Chung et al., 2017), tourists motivation (Ho and Gebsombut, 2019) are the impact of SM which is normative (Chung and Han, 2017). Young tourists are captivated by SM channels worldwide (Crowdriff, 2020). SM has now surpassed all other sources of tourism information (Jacobsen and Munar, 2012). Consequently, visitors' attitudes and behavior have changed, and SM's influence in online tourism is growing (Xiang and Gretzel, 2010). SM increase environmental consciousness, which speeds up sustainable development (Lively, 2011). By producing, sharing, and distributing content, SM applications connect individuals to online communities (Jussila et al., 2011). Many environmental campaigns have used social media to inspire people to sign petitions, share news, and raise awareness (Kaur, 2015). Idumange (2012) argues that SM may reach a broad audience and build EA. Previously, tourist information came from recollection, brochures, guides, travel agencies, journals, and friends (Blackwell et al., 2006). But lately, SM has overtaken all other tourist sources (Jacobsen and Munar, 2012).

The significant interaction of interpersonal and media with local communities suggests a specific linkage between SM and PA. It happens firstly; internet platforms let local community connects to interact (Castells, 2011); secondly, the interaction follows Person-Process-Place (personal, psychological, and geographical) paradigm, different from the traditional Man-Land connection (Scannell and Gifford, 2010). Psychological mechanisms mediate social media's vast space. Social networking may enhance PA and local ties by searching information which assists the tourists to plan (Snepenger et al., 1990), minimize confusion, and improve travel quality (Fodness and Murray, 1997). Hollander and Page (2020) found SM to be an effective tool for better understanding PA. SM promote EA, and it helps sustainable development (Lively, 2011). SM modifies the PA-ERB link (Xu and Han, 2019). So, we have reason to speculate:

H_1: SM might positively impact creating EA among tourists.
H_2: The usages of SM would positively and significantly impact PA to the tourists.

Organism: Environmental awareness (EA) & place attachment (PA)

EA is based on two concepts a) a collection of feelings and ideas about the interaction of conduct and environment (Kollmuss and Agyeman, 2002), b) the concept of environment and its problems (Uehara et al., 2016). EA and interpersonal relationships of travelers also decide their perceived consistency, environmental attitude and behaviors. SM connects the users within a virtual community (Zeng and Gerritsen, 2014), the interaction of virtual communal platforms may increase environmental consciousness in many ways (Idumange, 2012). Burgess et al. (1998) assumed that environmental knowledge leads to an environmental attitude, resulting in pro-environmental behavior. Thus, EA is a multi-dimensional construct, which consists of affective (e.g., concern or attitude), cognitive (e.g., knowledge), and conative (e.g., behavioral intention) factors, as Kollmuss and Agyeman (2002) proposed. Individual's attachments to a place are named PA (Yuksel et al., 2010). PA is a multi-dimensional description of a person's cognitive process and location (Scannell and Gifford, 2010). Leisure tourism researchers evaluated place identity and place dependency for PA (Kyle, et al., 2003). Though, place identification and place dependency influence the dependent variable differently (Budruk et al., 2009). For example, Kyle et al. (2004) discovered that the Appalachian Trail's circumstances were more problematic than location dependency. Place identity probably weighs more than place dependency the connection between people and place (Payton et al., 2005). However, PA can describe by place identity & dependence (Oh et al., 2012).

Arı and Yılmaz (2017) found that EA is related to people's motivation and behavioral intention to be pro-environmental. Chan (2001) predicted that environmental knowledge encourages eco-friendly behavior. For example, Ellen et al. (1991) found that environmental concerns influence diverse ERB, including composting and sustainable green consumption. Furthermore, studies believed that PA predicts ERB (Pietilä and Fagerholm, 2016). PA is also important in tourist forecasting and natural resource management (Warzecha and Lime, 2001). Many research focused on people's environmental actions in their former homes. Individuals develop a sense of place and engage in ERB and PA (Hines et al., 1987). Gosling and Williams (2010) argued that people connected to a place should voice their environmental concerns and become more aware of environmental problems. This concept leads to the following hypothesis.

H_3: The EA might have a significant direct effect on tourists' ERB.
H_4: The PA might significantly affect tourists' ERB.

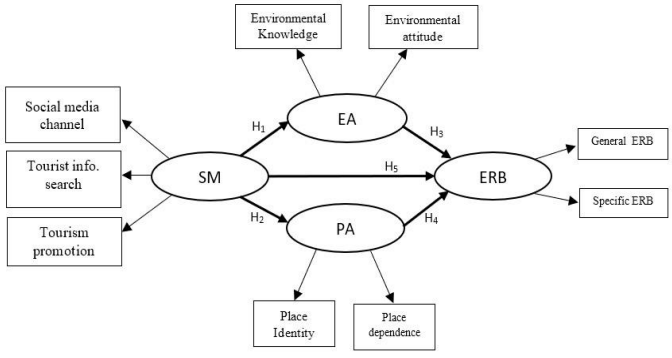

Figure 2. Research framework

Response: Environmentally responsible behavior of tourists

Environmentally Responsible Behavior (ERB) is a particular expression representing "any activity, person or community, aimed at environmental problems/problems" (Sivek and Hungerford, 1990). Tourists who participate in ERB will mitigate their impact on the environment (Kollmuss and Agyeman, 2002) and take environmental measures (Steg and Vlek, 2009). ERB is also deemed a crucial driver for good eco-tourism and sustainable growth (Lee et al., 2015). The measures of environmental behaviors are classified into six categories by Smith-Sebasto and D'Costa (1995): civic action, educational action, financial action, legal action, physical action, and persuasive action. Researchers (Cottrell, 2003; Vaske and Kobrin, 2001) have divided ERB into two sub-categories that is general ERB (encouraging family and friends to practice ERB) and specific ERB (recycling, buying green goods; using alternative types of transportation). Tourists show ERB through showing environmental activism and environmentally aware activities in their private life (Stern, 2000). Javed et al. (2020) founded direct and indirect impacts of tourists' ERB by SM. SM have modified visitor recycling behavior (Sujata et al., 2019), reconstructed consciousness (Nalewajek and Macik, 2013), and developed ERB (Robelia et al., 2011). Previously, visitor information channels tended to look into previous memories, brochures, guides, travel agencies, journals and relatives and family (Blackwell et al., 2006). Moreover, SM also overshadowed all conventional outlets as a medium for tourist information queries (Ho and Liu, 2005; Jacobsen and Munar, 2012). SM users are optimistic towards online interactions to produce mutual information rather than

receiving messages passively from websites (Hvass and Munar, 2012). The information created by social media users will persuade people to influence their beliefs and behavior, eventually (Lebe et al., 2014). In this way, it may rightly be assumed that:

H_5: SM might significantly affect to the ERB of tourists.

MATERIALS AND METHODS

In this section, we provided the items defining survey constructs. Next, we provided our data collecting method from the tourists of St. Martin's Island, a well-known tourism destination in Bangladesh. Subsequently, we express our data analysis approach.

1. Questionnaire design

After research modeling, we developed a questionnaire for a pilot study that included all of the original questions from the different sources. Thirty-five participants were asked to give feedback on the draft survey's question items. We also checked each scale's reliability (e.g., Cronbach's alpha and item-total statistics). Statistical analysis revealed excellent reliability (.91) and internally consistent validity (Cronbach's alpha values between 0.28 and 0.68). The question pools were condensed based on the pilot study's exploratory data analysis (to avoid likely respondent fatigue and incompleteness). Before participating in the pilot test, all respondents were pre-screened for recent tourist experiences and social media usage. We then described the source of survey question items. Three observed variables were used to measure SM; each observed variable had three items adapted from the study of Javed et al. (2020). Based on the study of (Kollmuss and Agyeman, 2002), EA is categorized by two observed variables named environmental knowledge and environmental attitudes. These two variables were measured by eight items which were taken from the study of (Cheng and Wu, 2015), (Severo et al., 2019), and (Lee and Jan, 2015). PA had two observed namely; Place identity and place dependence, taken from Budruk et al. (2009); Payton et al. (2005). The eight items of PA are cited from the study of Cheng and Wu (2015); Zhou et al. (2020) and (Lee, 2011). For the ERB scale, depending on Smith-Sebasto (1992) and Lee et al. (2013), two observed variables were founded: General behavior and specific behavior. Eleven items are taken from the study of (Cheng and Wu, 2015); (Su et al., 2020); (Lee, 2011); (Zgolli and Zaiem, 2018); (Lee et al., 2013); (Li et al., 2020), and (He et al., 2018) for measuring ERB. The scales ranged from "Extremely disagree" (1) to "Extremely agree" (5).

2. Sample design and data collection

The research conducted an online survey to get data from tourists who used SM and had visited St. Martin's Island, a renowned natural and environmentally diverse sensitive destination in Bangladesh's largest tourist metropolis (Cox's Bazar). The island's biodiversity includes 234 fish species, 187 mollusk species, 66 coral species, two seagrass species, 133 seaweed species, three mangrove species, 130 coastal and land birds, four marine turtle species, five sea snake species, nine marine mammals, and many terrestrial animals and plants (Ahammed et al., 2016). Four volunteered research assistants (university students) were trained and informed on the study's objectives, backgrounds, and data collecting procedure of research. Each data collector was allocated to a specific online SM travel group to ask the respondents to participate in the online survey politely. Notably, the research assistants ensured the respondents about the questionnaire's anonymity and personal information disclosures. The respondents were also assured that the survey data would only be handled for academic research and not for commercial purposes. After agreeing, the researcher assistant sends the Google form URL of the questionnaire to respondents. We formed the questionnaire in English; however, we provided a local language version for better understanding. After two weeks of delivering the questionnaire, the researcher followed up progress. The individuals who did not respond within three weeks were removed from the sample list. The online survey was conducted from May to June 2021. The research assistants were dutiful to clarify questions and were not influenced by respondents. Once filled out, the questionnaire was sent to the researcher's server. The sample size for analyzing the data using SEM, 250 to 500 indicates good (Schumacker and Lomax, 2016). Following this suggestion researchers targeted at least 450 respondents and sent the 500 surveys to the four largest online travel groups in Facebook as mostly used social media in Bangladesh namely: Travelers of Bangladesh-ToB (1.1 million members), Tour Group BD (811,000 members), Travellers of Bangladesh (411,000 members), and Bitto Travel and Tourism (50,000 members). Within 500 respondents, 482 respondents replied where 467 were suitable (93.4% valid response) for analyzation. In the research, we applied a purposive sampling technique using screening questions asking the respondents about using social media in their daily life and the traveling experience to visit the island. After getting the positive answer, the google link was sent to the respondents to participate in the online survey.

3. Data analysis

After completing the data collection, the researcher focused on data processing and analysis using SPSS. First, we examined the descriptive data, then tested normality. After that appeared the correlation between variables. A measurement model was then performed to measure the model's quality. The SEM method was used to evaluate the fit of data and theoretical model then the model's hypotheses were tested.

RESULTS AND DISCUSSION

The general features of the respondents related to demographic characteristics was described in this section. After that, the construct reliability and validity were checked along with confirmatory factor analysis to measure the model.

1. Sample analysis

Table 1 shows the demographics of the research sample. Among participants mainly are young (45.40 %) with males

(79.44%) and females (20.56%). Principally are educated with higher secondary school certificate (38.80%), and master degree (35.10%). A rambling income distribution revealed that the majority of individuals had no income (52.46%) or less income (19.71%). Mostly use Facebook (84.80%) as SM by smartphone (93.58%) for a long time (>5 years-65.95%). Most participants (83.75%) have notable travel experience.

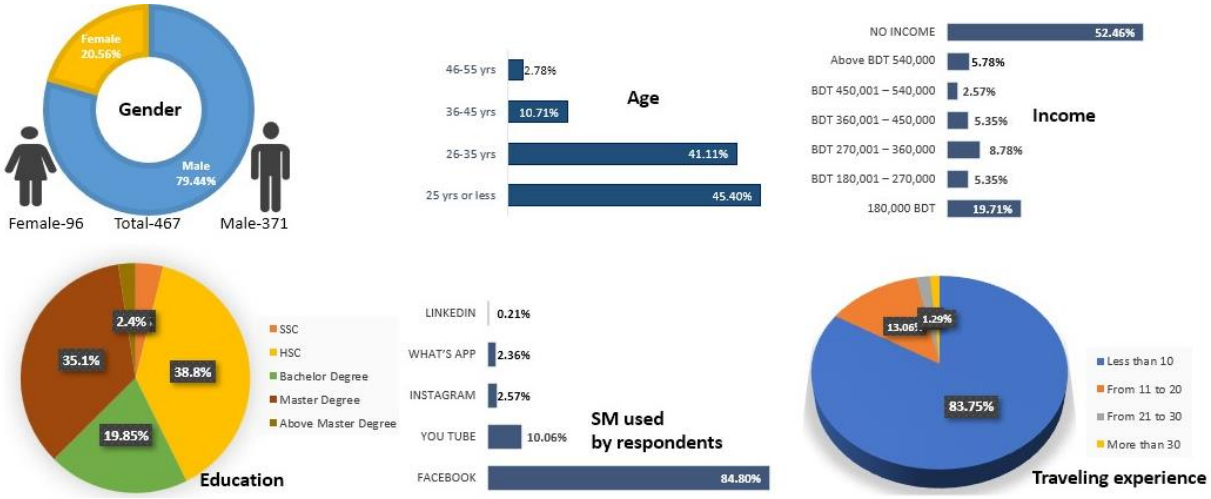

Figure 3. Samples in graphs & charts

Table 1. Demographic data of participants

variables		n	%	variables		n	%
Gender	Female	96	20.56	Type of using SM	Facebook	396	84.80
	Male	371	79.44		You Tube	47	10.06
Age	25 Years or less	212	45.40		Instagram	12	2.57
	26 – 35 Years	192	41.11		What's app	11	2.36
	36 – 45 Years	50	10.71		LinkedIn	1	0.21
	46 – 55 Years	13	2.78	Years of using SM	Less than 1 years	24	5.14
Education	Secondary School Certificate (SSC)	18	3.85		1 – 3 years	49	10.49
	Higher Secondary School Certificate (HSC)	181	38.80		3 – 5 years	86	18.42
	Bachelor Degree	93	19.85		More than 5 years	308	65.95
	Master Degree	164	35.10	Devices for using SM	Smartphone	437	93.58
	Above Master Degree	11	2.40		Desktop/Laptop	27	5.78
Income	≤ BDT 180,000	92	19.71		Tablet	1	0.21
	BDT 180001- 270,000	25	5.35		Others	2	0.43
	BDT 270,001- 360,000	41	8.78	Travelling Experience	Less than 10 destinations	391	83.75
	BDT 360,001- 450,000	25	5.35		11 – 20 destinations	61	13.06
	BDT 450,001- 540,000	12	2.57		21 – 30 destinations	9	1.93
	Above BDT 540,001	27	5.78		More than 30 destinations	6	1.29
	No income	245	52.46				

2. Measuring the model

2.1. Confirmatory factor analysis (CFA)

A descriptive statistical analysis of all indicators should be run before evaluating data for CFA and SEM (Hair, 2009). The coefficients of variation (17.39 to 33.76), Skewness (±2.15), and Kurtosis (±5.22) were all significant at the .01 level. After ensuring the data was normal, CFA was used to assess the inter-item correlation of structural components and dimensions of the structure. CFA model fit indices showed how well it matched the data. χ^2, NFI, CFI, RMSEA, and CMIN/DF values were considered to assess goodness-of-fit (Abubakar and Ilkan, 2016).

A measurement model's acceptable χ^2/df value is ≤ 3 (Johnson et al., 1995). The χ^2/df score was 1.078; RMSEA= 0.013<0.05, GFI=0.95, NFI=0.96, CFI=0.99, TLI=0.99, and AGFI=0.92 which is acceptable by Schumacker and Lomax (2016). As a consequence, the measurement model fits the data well.

2.2. Construct reliability and validity

Construct reliability and validity were tested to demonstrate inter-item consistency and connections of the model's latent variables. Composite reliability measures the internal consistency of observable variables or items (Netemeyer et al., 2003). It's a metric of the observed variables' shared variance used to find a latent construct (Fornell and Larcker, 1981). Tseng et al. (2006) suggest a criterion of 0.60 or up for composite reliability. Cronbach's alpha and composite construct reliability were used to evaluate measuring reliability. The Cronbach's alpha of constructs varies from 0.87 to 0.92 (Table 2). Composite reliability spans from 0.75 to 0.89, which is higher than cutoff 0.60. For each construct, it ensures appropriate internal consistency by Tseng et al. (2006). Convergent and discriminant validity are two aspects of construct validity. Convergent refers to the measurements of how closely it correlates with other variables. Discriminant validity, on the other hand, is a measure of how remotely linked constructs are. The cutoff of convergent validity is

>.50, or if the AVE is higher than the squired correlations between any two constructs, it is satisfied (Fornell and Larcker, 1981). It was determined that all item factor loadings were more than or equal to 0.52 with a significance level of 0.01, indicating satisfied convergent validity (Anderson and Gerbing, 1988). The AVE was 0.57-0.79 (cutoff 0.50), which explained that constructs are significant in the variables (Fornell and Larcker, 1981). All of this shows measure convergent validity. Discriminant validity is substantial if the AVE squire root between two constructs is higher than the correlation (Fornell and Larcker, 1981). There are no correlation coefficients more than 0.74 and no squire roots of AVEs less than 0.75 (Table 3), suggesting that the scales in this research are discriminately valid. So, the measurement model consists of 4 latent variables consequently SM (3 observed variables with 9 items), EA (2 observed variables with 8 items), PA (2 observed variables with 8 items), and ERB (2 observed variables with 11 items) (Table 2).

Table 2. Empirical results of the measurement model

Construct	Observed	Observed Items	Mean	SD	F. loading	C. Reliability	AVE	√ AVE	Alpha
SM	Social media channel	Actively users of social media channels	3.49	0.94	0.74	0.92	0.57	0.75	0.87
		Actively upload contents in social media	3.73	0.88	0.84				
		Impacts of social media while travelling	3.14	1.06	0.61				
	Tourism promotion	Promoting/advertising tourism activities	3.92	0.77	0.78				
		Assessment of social media to led promoting tourism	4.06	0.81	0.76				
		Environment protection by the announcement in SM	4.01	0.78	0.75				
	Tourist information search	Importance of SM for searching information and making decision	4.10	0.80	0.81				
		SM helps searching authentic and reliable information	3.81	0.82	0.79				
		Searching external information for new destination	3.84	0.80	0.68				
EA	Env. knowledge	Knowledgeable to the maintenance of ecological balance	4.02	0.81	0.76	0.89	0.71	0.84	0.89
		Natural resources of islands should protect for future	4.42	0.85	0.72				
		The impact of activities on the natural environments	3.92	0.88	0.71				
	Env. attitude	Usual activities on environmental issues	3.91	0.78	0.70				
		Feelings of motivation for adopting improved env. attitudes	4.06	0.73	0.82				
		Raising environmental protection awareness	4.37	0.76	0.69				
		Humans interfere to nature produces disastrous consequences	4.21	0.85	0.59				
		Humans will eventually learn about how nature works	4.32	0.82	0.72				
PA	Place Identity	Feelings of touring in the destination	4.05	0.84	0.75	0.93	0.79	0.89	0.91
		Feelings to learn about the destination by revisiting	4.15	0.83	0.83				
		Sense of belonging concerning the island	3.79	0.86	0.78				
		Personal feeling about the island	3.75	0.91	0.70				
	Place dependence	Intend to spend more time in the destination	3.72	0.89	0.75				
		Enjoyment in traveling to island more than other destinations	3.75	0.90	0.89				
		Satisfaction of visiting island than another place	3.73	0.85	0.91				
		Finding substitute of this destination	3.47	0.95	0.75				
ERB	General behavior	Willingness to solve the environmental problems of the island	3.87	0.82	0.82	0.93	0.73	0.86	0.92
		Reading about the environments of the island	3.57	0.83	0.67				
		Status of convincing the travel companions to the island	3.84	0.80	0.76				
		Buying environmentally sound product	3.91	0.79	0.73				
		Intentions to learn more about the local environment	3.91	0.76	0.81				
	Specific behavior	Efforts to learn more about culture of island	3.82	0.78	0.81				
		Activities to reduce the interference the nature of island	3.85	0.81	0.80				
		Following the legal ways for stopping the destruction of island	3.81	0.81	0.74				
		Garbage related action while visiting the island	3.81	0.87	0.70				
		Willingness to lessen/stop visiting the island if it is needed	3.75	0.88	0.52				
		Measuring the environmental damaging activity while travelling	4.18	0.83	0.72				
Goodness-of-fit indices		χ^2 =427.26, *df* =397, χ^2/df=1.078, *p* =.142, *GFI* =.952, *AGFI*=.92, *RMSEA* =.013, NFI=0.96, TLI=0.99, CFI=0.99							

2.3. Structural model analysis

2.3.1 Correlation coefficient of variables

The correlation of all variables in SEM was significant at the statistical level p<.01. According to Schober et al. (2018), the correlation of <0.1 indicate negligible where >0.9 indicate very strong correlation. The lowest correlation was between SM and PA (.58) and the highest correlation was between EA and ERB (.74) (Table 3). These correlation coefficients indicated that the data are good enough for analyzing with the structural equation modeling.

Table 3. The correlation and AVEs of variables

Variable	SM	EA	PA	ERB
SM	**.75**			
EA	.71**	**.84**		
PA	.58**	.61**	**.89**	
ERB	.62**	.74**	.73**	**.86**

**p< .01; (Bold numbers refer to the squire root of AVE)

Table 4. The model fit indices of the ERB model

Criteria Index	Model fit criteria	Scores	Results
Chi-Square (χ2)	*p >.05*	χ^2 =22.84 (*p*=.08)	Passed
χ2/df	<2	1.43	Passed
RMSEA	<.05	.03	Passed
SRMR	<.05	.01	Passed
GFI	>.95	.98	Passed
CFI	>.95	.99	Passed
NFI	>.95	.99	Passed

2.3.2 Goodness-of-fit indices

The value of χ2, GFI, NFI, CFI, RMSEA, SRMR, CMIN/DF (χ^2/df) values are considered to evaluate the goodness-of-fit indices (Abubakar and Ilkan, 2016). The acceptable χ^2/df value of a measurement model is ≤ 3 (Johnson et al., 1995). The value of Chi-Square equal to 22.84, *df*=16, χ^2/df=1.43, RMSEA=.03, CFI=.99, GFI= 0.98, SRMR=0.01, NFI=0.99 (Table 4). According to the suggestion of model fit criteria of Schumacker and Lomax (2016), the proposed model perfectly fits (Table 4).

2.4 Hypothesis testing

Table 5 shows structural path model result proposed in this study. The effect of SM on EA (β=0.92, p<.01); SM on PA (β=0.70, p < .01); EA on tourists' ERB (β=0.84, p < .01), and place attachment's effect on tourists' ERB (β=0.58, p<.01), which suggested that H1, H2, H3, and H4 were supported. Therefore, the direct effects of SM on tourists' ERB at β = -*.43* (indirect effects β = 1.17, total effects β = .75) at value p<.01, which also support the H5, though it has significant negative effects but still positive in total and indirect effects to ERB.

Table 5. Hypothesis testing result (*p< .01)

SL	Hypothesis	Path	Std. Path loading	Conclusion
H_1	Social media → Environmental awareness	β	0.92*	Supported
H_2	Social media → Place attachment	β	0.70*	Supported
H_3	Environmental awareness → ERB	β	0.84*	Supported
H_4	Place attachment → ERB	β	0.58*	Supported
H_5	Social media → ERB	β	-0.43*	Supported

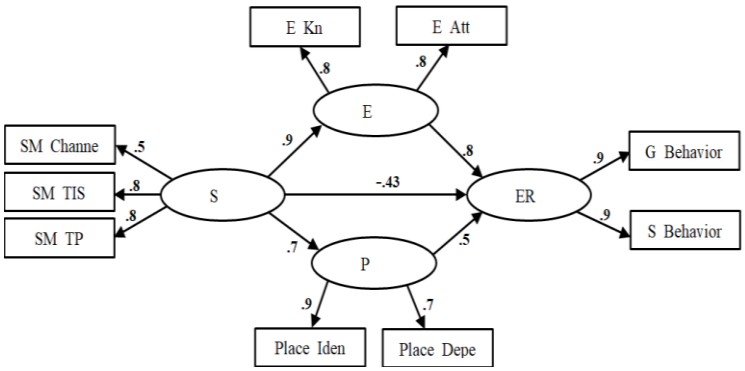

Figure 4. Result of path analysis

2.5 Analysis of model

It is worthy to note that the current study also examined the model that includes the three key components in the typical S-O-R framework and the ERB variables (from the proposed theory). The value of χ2/df was 1.43 (cutoff less than 3.00); RMSEA= 0.03<0.05; SRMR=0.01<.05; GFI=0.98, NFI=0.99, TLI=0.99, CFI=0.99 all of which were greater than the 0.95 cutoff suggested by Schumacker and Lomax (2016). As Fig. 4 shows, the effect of SM on EA (β=0.92, p<.01); SM on PA (β=0.70, p < .01); EA on ERB (β=0.84, p < .01), PA's effect on tourists' ERB (β=0.58, p<.01), and SM to ERB (β= -0.43, p < .01). The model explained 90%, 84%, 49%, and 84% of SM, EA, PA, and ERB variance, respectively. This competing model appears to be reasonable to predict tourist ERB based on the fit indices and path coefficient.

CONCLUSION

1. Discussion

Prior research established the statistical significance of the research results. The ERB model of SM users showed high goodness of fit (Schumacker and Lomax, 2016). The study found that SM widespread pressing EA and PA may cause ERB in tourists. Jussila et al. (2011) and Lee and Ma (2012) showed that users might share, communicate, and collaborate their ideas and experiences by creating and distributing material (media and text). Idumange (2012) recommended using popular SM channels like blogs, Facebook, Twitter, and YouTube to increase EA. According to this study's structural path analysis, EA generated by SM may understand tourists' ERB. We had found the evidence (Idumange, 2012; Kaur, 2015) to support the conclusions. SM is also important since it affects place attachment and, therefore, tourist ERB. Travelers who use SM properly are more likely to develop positive opinions and help to develop the positive images to destinations to others and themself. The findings of this study make pervious research more concrete. The research looked at the effects of SM on place attachment. Xu and Han (2019) discovered that SM alters the relationship between place attachment and pro-environmental behavior. Hollander and Page (2020) showed emotional analysis to comprehend better PA perspectives utilizing SM. This research found an association between environmental awareness and tourist ERB. The results show that EA generated from using SM has a significant effect on ERB. According to Arı and Yılmaz (2017), EA increases people's motivation and behavioral intention to be pro-environmental. Song et al. (2019) discovered that EA influences behaviors like purchasing green products. Cheng and Wu (2015) discovered that environmental awareness influences behaviors like purchasing green products. Other researchers found similar to this work including He et al. (2018); (Lee and Oh, 2018); Su et al. (2020). This study's results quantitatively support the significant effect of environmental awareness on ERB.

The study also explores that the place attachment raised from SM affects tourists' ERB, which upholds the previous research. According to Lee (2011), people attached to a place express environmental problems and become more conscious. The quantitative research of Pietilä and Fagerholm (2016) showed that place attachment is an ERB predictor. Cheng et al. (2013) founded visitors attached to islands are more inclined to show ERB.

This study's model shows the benefit of integrating EA and PA via social media to understand tourist ERB. It also backed up the integrated tourist behavior model based on S-O-R theory. DMOs are increasingly faced with severe environmental problems (Cheng and Wu, 2015; Han, 2015) due to visitors' behavior (Chang, 2010). Contents of SM

affects tourist motivation and behavior (Javed et al., 2020), recycling behavior (Sujata et al., 2019), consumer awareness (Nalewajek and Macik, 2013), and developed ERB (Robelia et al., 2011). The research found that social media has substantially effects on tourists' ERB, which merged Javed et al. (2020) findings. Su et al. (2020) revealed that visitors' gathered experiences influence tourists' ERB. However, this study found that SM has significant direct and indirect impact on tourists' ERB which strengthen the findings of Javed et al. (2020). Though the direct impact is negatively and indirect impact is positively significant. Goh et al. (2013) founded that marketer-generated content has less influence on consumer behavior than user-generated content. Some researcher for example, Abbas et al. (2019) found the negative impact of using social media of student learning behavior. Taha et al. (2021) showed a significant difference in use of SM during the first wave of the COVID-19 pandemic which may impact on consumer behavior. However, the study showed that social media has significant influence on raising EA and generating PA to mass tourists' which significantly impact to tourists' ERB.

2. Implication

1. Theoretical contribution

The results supported the researcher's paradigm, which may be very fruitful for the tourism industry of Bangladesh and any other country with a similar context. Following the S-O-R theory, this research found some dimensions linked to SM and its influence on EA and PA, which impact tourists' behavioral intention and actual behavior. SM has unavoidable importance as a source of destination information and environmental attitudes among visitors when purchasing tourism goods. Furthermore, this research found that SM-generated EA and PA may significantly contribute to tourists' ERB. Our study suggested that the S-O-R framework may be defined by tourists' consumption, prompted by SM and results in EA and PA, with the visitors' ERB as the output. The findings provide a significant contribution to the understanding of consumer behavior in different nations, in other contexts, particularly in Bangladesh. As a result, the suggested approach may be applied to various developing-country contexts or destinations.

2. Application contribution

This study's sample was highly representative of visitors using the random sampling method. As a result, the study's findings may be used to enhance marketing campaigns and standardize mass tourism's environmental responsibilities via SM. Domestic travel in Bangladesh is dominated by young people, particularly those under 35. The research found that Bangladeshi visitors use SM to exchange travel experiences and destination information. For developing SM, tourists are more informed and skilled in travel planning, exchanging experiences, and searching for attractions everywhere and anytime (Jin et al., 2014). Based on this finding, DMOs should utilize digital channels like SM to promote destinations, share information, increase EA, and attached to new places for all tourists, especially young people. The tourism marketers can focus on their targeted consumers specifically to young tourists to extend their market using SM platforms by sharing attractive and educative contents. Both DMOs and tourism policymakers should be aware of the findings of this study. To enhance the sustainability of tourism destinations and the tourism sector, DMOs and business managers should closely be careful with social media channels. Because of SM's importance, it is necessary to remain updated in providing relevant information and be available on such tourist information searches to the potential tourists. Notably, tourism promotion significantly affects visitor behavior, whereas SM has become essential for attracting tourists. In a competitive business context, DMOs and tourism policymakers should develop an appropriate marketing plan.

DMOs should develop policies and procedures (e.g., promoting eco-friendly practices and activities, exploring ecological complexity of the destination through social media) for environmentally sensitive destinations to raise EA and build good relationships with mass tourists. Social media is an excellent medium for linking mass visitors to a set of eco-friendly conservation activities. Destination eco-friendly marketing through SM may assist DMOs to create an effective strategy to nurture and increase visitors' ERB. DMOs should regularly post environmental awareness, ecological imbalance, visitor duties on the destination's website, and other social media verified sites. This activity will assist in increasing environmental awareness among mass tourists about recycling and eco-friendly tourism. The site can retain its competitive advantage by attracting (e.g., to social media travel communities) and reassuring visitors about the location's environmental problems. Tourists would have been wary of purported ecological initiatives. These activities will show the significance of environmental issues for the destination as well as the tourist industry. And finally, the goal of sustainable, eco-friendly development will be enriched both offline and online by tourists themselves. DMOs should Involve visitors in the early stages of functional attachment and encourage them to become emotionally attached to locations. Giving people good memories of a place may enhance their emotional connection (Ujang and Zakariya, 2015). Improving beach quality, recreational activities, and civic participation may attract mass visitors. It may also enhance tourist emotional connection. Lokocz et al. (2011) described PA as social and personal engagement to the destination. Including visitors in the maintenance of a destination's environment may assist create sustainable tourism plans. Tourists with a feel of location will take part in ERB, which will energize DMOs and policymakers. Environmentally aware tourists are more likely to join local conservation initiatives. Hearing from communities can help to create more effective environmental and tourism development plans (Shandas and Messer, 2008). DMOs shall also present signboards, interpretive programs, guided tours, environmental education activities, and printed and online information to preserve natural and cultural resources.

3. Limitations and directions for future research

In general, no studies are without limitation. This study contains some shortcomings. First, the ERB question items in this study may have overlooked some key elements that future research may explore. A more general ERB paradigm may

categorize ERB components. Second, contrary to the results of this research, it seems that using social media to ERB has a direct positive connection. We think further study should delve into this. Third, examining moderating effects connected with sociodemographic characteristics may help strengthen the argument presented in this article and better understand the model variables' impact, which may be found by further research. Fourth, the sample is not representative of all site visitors. Moreover, visitor profiles may change time by time as individuals expect to see multiple activities. Consistency testing is complex with this convenience sample. Having some limitations of respondents (e.g., young aged, no income, somewhat educated, domestic tourists), the study's generalizability might be limited. The study's research methodology should be verified, such as semi-structured method, across cultures, tourism destinations, and settings (e.g., highly or moderate-income tourist, domestic tourist vs foreign tourist, including tourism-related scholars and people in business). Fifth, future studies may collect long-term data to examine the integrated model's other factors' effects on social media and ERB. Longitudinal data would enable future researchers to see how time impacts people's use of social media and their ERB and if the advantages of eco-tourism are long-lasting. Sixth, ERB may be measured before and after an experiment to see how visitors react to eco-friendly sites. Future researchers may utilize this kind of data to improve the model's causality argument. We encourage tourism scholars to look at these study options to broaden the scope of sustainable and eco-friendly tourism research. Finally, in the future, the researchers should include some more variables such as destination ecological reputations, psychological factors, tourists' perceptions and attitudes toward sustainable tourism development, and support for sustainable tourism development should be studied to determine ERB's causality.

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