The Effect of Tangibility on Assurance and Reliability: The Mediating Role of Empathy and Responsiveness in Ecotourism

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Abstract

The objectives of this study were: (1) to examine the effects of tangibility on assurance and reliability, and (2) to examine the mediation of empathy and responsiveness and the effects of tangibility on assurance and reliability in ecotourism in the upper northeastern region of Thailand. This survey research used questionnaires to collect data from 392 samples. Quantitative data were statistically analyzed using structural equation modeling. It was found that tangibility influenced empathy and responsiveness, which in turn influenced assurance and reliability. The managerial implications are discussed.

Keywords: Servqual, Ecotourism, Structural Equations

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ผลกระทบของลักษณะทางกายภาพที่มีต่อการประกัน และความไว้วางใจ: การคั่นกลางของการเอาใจใส่ลูกค้า กับการตอบสนองของการท่องเที่ยวเชิงนิเวศ

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาผลกระทบของลักษณะทางกายภาพต่อการเอาใจใส่นักท่องเที่ยวและการตอบสนอง และ 2) เพื่อศึกษาการส่งผ่านของการเอาใจใส่และการตอบสนองของความสัมพันธ์ระหว่างลักษณะทางกายภาพต่อการตอบสนองและความน่าเชื่อถือในการท่องเที่ยวเชิงนิเวศในภาคตะวันออกเฉียงเหนือตอนบน การวิจัยเป็นการวิจัยเชิงสำรวจ โดยใช้แบบสอบถามเก็บข้อมูลจากนักท่องเที่ยวจำนวน 392 ตัวอย่าง สถิติวิเคราะห์ข้อมูลคือแบบจำลองสมการโครงสร้าง การวิจัยพบว่าลักษณะทางกายภาพมีผลกระทบต่อการเอาใจใส่นักท่องเที่ยวและการประกัน และการเอาใจใส่นักท่องเที่ยวและการตอบสนองเป็นตัวแปรคั่นกลาง

คำสำคัญ: เซิร์ฟควอล การท่องเที่ยงเชิงนิเวศ แบบจำลองสมการโครงสร้าง

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1. Introduction

Ecotourism is one of the fast growing sectors of the hospitality and tourism industries worldwide (Bjork, 2000; Buckley, 2000). The International Ecotourism Society (TIES) defined ecotourism as responsible travel to natural areas that conserves the environment and improves the well-being of local people (The International Ecotourism Society, 2010). Ecotourism also refers to the interlinkage among three factors, the environment, active learning and sustaining socio-cultural and natural environments (Weaver, 2001). Alternatively, sustainability includes environmental responsibility, local economic vitality, cultural sensibility and experiential richness.

The usefulness of the ecotourism includes wilderness and undisturbed nature, learn about nature, natural parks and reserves, tropical forests/indigenous bush, lakes and streams, photography of landscape/wildlife and world heritage status area (Juric et al., 2002). Furthermore, benefits of ecotourism include conserving biodiversity, sustaining the well-being of local people; experiential learning; responsible action by tourism stakeholders; the use, where possible, of renewable resources; and local participation and ownership (Sirakaya et al., 1999). Singh et al. (2007) suggested that a large segment of the population attending soft ecotourism events, which is older, educated, and affluent ecotourists who participate in the events for entertainment as well as learning. Hvenegaard & Dearden (1998) indicated that a research on Thai ecotourism has focused on three areas such as national park visitation, hilltribe trekking, and nature trekking.

These are significant issues for Thailand, which is a perfect destination for those looking for an adventurous and eco friendly holiday. As one of Southeast Asia's premier holiday destinations, the Kingdom can offer different levels of adventure, from trekking in the North to scuba diving among coral reefs in the South to bird watching in Thailand's plentiful national parks. The landscape varies from the mountainous to flat lands, and the ethnic diversity of the country makes travelling off the beaten track an adventure in itself (Weaver, 2002; Sangpikul, 2007).

In keeping with the times, Thailand now offers agritourism for those who want to experience the lives of farmers, fishermen or plantation owners with homestay programmes. With awareness of the need for sustainable growth, the country's tourism industry has also promoted eco-tourism to allow visitors the opportunity to participate in green activities (Untachai et al., 2011; Jones, 2005). Phu Foi Lom, Wang Sam Mo Forest Park, and Pink Water Lily Lake, for instance, are attractions located in the Upper Northeast of Thailand (Rittichainuwat et al., 2001).

Additionally, the Tourism Authority of Thailand has generally provided a unique set of opportunities for greening cities and city-based tourism as well as to educate people and industries about green and ecotourism practices. Chomchang Homestay, for example, is a standardized and popular homestay in Nongkhai Province. It is situated 18 kilometer from the city along the Maekhong River in Tambon

Si Kai Muang Nongkhai. With 37 housing services, Chomchang Homestay can accommodate 200 tourists per day. Its activities aim to promote sustainable tourism as well as to preserve tourism resources through ecotourism. It focuses on observing the balance of nature, the local traditions and social values, and community lifestyle. It encourages local participation, leading to a strong community process, a fair income distribution and indigenous knowledge.

In the current changing global environment, many industries are facing increasing competition that forces them to seek competitive advantages, efficiency, and profitable ways to differentiate themselves (Yang, 2003). In both the domestic market and internationally, the service concept is gaining importance in parallel with economic development and increasing standards of living (Font & McCabe, 2017; Meidan, 1984). The tourism industry is a service-dominant logic. The service quality is the antecedent of both destination image and tourist loyalty (Akroush et al., 2016). SERVQUAL is service quality measurement, which has become the main subject of several empirical and conceptual studies in the hospitality and tourism marketing disciplines (Kotler et al., 2010). Various scales and indices, such as SERVPERF, SERVICESCAPES, ECOSERV, HISTQUAL, and QUESC have been developed and extensively used by academics and practitioners (Parasuraman et al., 1988; Cronin & Taylor, 1994; Frochot & Hughes, 2000; Khan, 2003; Kim & Kim, 1995). A few of the previous studies investigated and found the mediation of empathy on the effect of tangibility and on assurance factors. Therefore, a purpose of this paper is to develop and empirically test the service quality model in ecotourism based on the SERVQUAL measurement.

2. Conceptual Framework and Hypotheses Development

Ecotourism

Ecotourism has the natural environment, learning and sustainability as components (Weaver, 2001). First, the focus of attraction is natural environments (e.g., rainforests or grasslands) or specific components thereof, such as a particular type of animal or plant. Ecotourism is therefore essentially a form of nature based tourism. Nature-based tourism refers to a type of tourism activity that integrates education, recreation, and adventure elements (Buckley, 2000; Buckley, 2004). Second, ecotourism emphasizes learning as an outcome of the interaction between ecotourists and the natural environment. Finally, while some definitions emphasize the notion of ecological sustainability, most also include an economic or socio-cultural dimension, on the assumption that these can neither be easily divorced from the other nor from ecological sustainability (Hall, 2000). A wide range of ecotourism activities can be accommodated under this definition. He classified ecotourism by activity type (e.g., bird watching, whale watching, geological tourism) into hard and soft classes.

Alternatively, active ecotourism, which tends to involve a small number of environmentally aware participants who embark on relatively long specialized trips, expect few services during those

trips, and have physically active, non-mediated experiences with the natural environment. Conversely, the soft segment tends to embark on shorter ecotourism experiences as one component of a multi-purpose trip. These travelers expect a high level of comfort and services and are more likely to rely on interpretation and mediation to appreciate the relevant natural attractions. An important distinction is that soft ecotourists are usually associated with steady-state sustainability, or leaving an area in the same condition as when they arrived. In contrast the hard ecotourist supports enhancement of sustainability, or improving the condition of the physical environment through donations and volunteer activity (such as tree planting). Research carried out in several ecotourism destinations, while involving different populations and methods, generally supports this concept of an ecotourism spectrum (Weaver, 2001; 2005).

Meric and Hunt (1998) identified four types of ecotourists. These include 1) hard-core nature tourists who are scientific researchers or members of tours designed for education, 2) dedicated nature tourists who take trips specifically to protected areas to understand local, natural and cultural history, 3) mainstream nature tourists who visit natural parks, and 4) casual nature tourists who partake of nature incidentally as part of a broader trip. Wight (1996) found that the most important feature for experienced ecotourists included wildlife viewing, hiking/trekking, and visiting national parks or protected areas. Alternatively, the most important feature for general consumers were activities such as casual walking, wildlife viewing, learning about other cultures, visiting national park or protected area, and wilderness settings. Moreover, Ayala (1996) pointed out that an eco resort combines quality with profitability through an added value to tourists' experiences, by a skillful interpretation of a natural or cultural phenomenon. Still, Singh et al. (2007) suggested that ecotourists are of three types, soft, structured, and hard ecotourists. Structured ecotourists prefer intellectual interpretation, third party organization of trips and use of travel experts. They are also likely to visit less well-known destinations and consider themselves dedicated ecotourists.

Tourism and Service Quality

Quality in tourism is an important factor and ultimately leads to the success of a tourism business. As Kandampully (2000) emphasized, quality will be the main driving force as tourism firms strive to meet the competitive challenges of the future (Atilgan et al., 2003). The World Tourism Organization (WTO, 2003) has defined quality in tourism as:

> "... the result of a process which implies the satisfaction of all the legitimate product and service needs, requirements and expectations of the consumer, at an acceptable price, in conformity with the underlying quality determinants such as safety and security, hygiene, accessibility, transparency, authenticity and harmony of the tourism activity concerned with its human and natural environment."

The issue of service quality has received considerable attention in the marketing and tourism literature. As a result, the delivery of higher levels of service quality is a strategy that is increasingly being offered as a key (Parasuraman et al., 1988; Cronin and Taylor, 1992) to position themselves more effectively in the marketplace (Akroush et al., 2016; Yolal et al., 2017). However, several scholars have identified a problem inherent in the implementation of such strategy. Service quality is an elusive and abstract construct that is difficult to define and measure (Rahman et al., 2017).

Gronroos's (1988) concerns about the dimensions of service quality are about what and how. 'What' the service delivers is evaluated after performance (Asubonteng et al., 1996). This dimension is called outcome quality by Parasuraman et al. (1988) and a technical quality from Gronroos. 'How' the way that the service is delivered and it is evaluated during delivery. This dimension is called process quality by Parasuraman et al. (1988) and Asubonteng et al. (1996), functional quality by Gronroos (1990). He suggested that there are six determinants of good service quality, i.e., professionalism and skill, attitude and behavior, accessibility and flexibility, reliability and trustworthiness, recovery, and reputation and creditability.

As Parasuraman et al. (1985; 1988) defined perceived service quality as a global judgment or attitude, relating to the superiority of the service (Asubonteng et al., 1996). Additionally, they linked perceived service quality to the constructs of expectations and perceptions. Perceived quality is viewed as the degree and direction of the discrepancy between consumers' perceptions and expectations, the so-called 'P E' framework. Then, they developed the SERVQUAL scale to measure perceived service quality. This scale consists of five dimensions, i.e., reliability, assurance, tangibility, empathy, and responsiveness (RATER) associated with 22 items (Zeithaml et al., 1990).

The SERVQUAL scale is a popular tool in the service industry because of its ease of application and flexibility. However, there are some serious problems in conceptualizing service quality as a difference score. A difference score involves the subtraction of one measure from another to create a measure of a distinct construct. Since both expectations are measured using 22 questions, and performance is rated using 22 parallel questions, 44 questions in total are used (Asubonteng et al., 1996). The problems that arise are reliability, discriminant validity, and variance restriction. This scale is often used to study the perceived quality in the retail, as well as in the service sectors. Klemz & Boshoff (2001) used the SERVQUAL scale to examine whether customers perceive environmental and induced emotional influences in the same way for different retailers and whether these influences have differential effects on a customer's willingness to buy. They found that small downtown retailers primarily use empathy to influence willingness to buy, while the large national one stop chains in small towns primarily use assurance to influence willingness to buy. More specifically, the small retailers manage empathy through responsiveness, whereas the large national chains balance tangibility, reliability and responsiveness to jointly influence assurance. Similarly, Mels et al. (1997) investigated the empirical factor structure of

SERVQUAL data from five samples of clients who evaluated the services of their banks, insurance brokers, motor vehicle repair service stations, electrical repair service companies and life insurance firms. They found that service quality perceptions were largely determined by two dimensions, namely extrinsic and intrinsic service quality. Additionally, Lam & Woo (1997) examined the reliability of SERVQUAL using a test-retest correlation method. They found that the SERVQUAL scale is not stable over time. Although items in the expectation battery of SERVQUAL scale remained fairly stable over time, the performance items were subject to instability. Moreover, Brady & Cronin (2001) referred to service quality as 1) an organization's technical and functional quality, 2) the service product, service delivery, and service environment, or 3) the reliability, responsiveness, empathy, assurances, and intangibility associated with a service experience (Asubonteng et al., 1996; Gronroos, 1990). They suggest that for each of these sub-dimensions to improve service quality perceptions, they must be reliable, responsive, and empathetic. They also suggest that service quality is a multidimensional hierarchical construct.

Various authors applied the SERVQUAL scale to the tourism and hospitality sectors with little modification. For, example, Atilgan et al. (2003) examined the relative importance attached to each of the expected and perceived service-quality dimensions for Turkish tour operators. They developed 26 items related to the five service dimensions of the original SERVQUAL scale. They suggested that assurance, reliability, and responsiveness are the most important dimensions related to tourist satisfaction. Similarly, Hwang et al. (2003) modified the five dimensions of SERVQUAL to design 32 items for evaluation of the service quality of interpretation services at national parks. They argued that empathy, reliability, assurance, and tangibility are correlated to interpretation satisfaction and loyalty (Yolal et al. (2017). Chang (2009) also used modified SERVQUAL dimensions to evaluate travellers' perceptions of service quality on guided package tours. The study found that the dimension of tangibility was less significant when compared with other dimensions in terms of customers' perceptions of service quality. Other elements such as communication and sociability were critical when applied to the travel industry in a particular ethnic group.

HISTOQUAL scale is an application of the SERVQUAL scale to historical properties of services conducted by Frochot and Hughes (2000). This scale consisted of five dimensions, responsiveness, tangibility, communications, consumables, and empathy. This study revealed that tangibility and communication were the most important aspects of historic house services provision. Similarly Bhat (2012) examine the reliability and validity of the SERVQUAL scale for the tourism sector.

Maestro Hernandez et al. (2007) identified five components of perceived quality in rural tourism in Spain. These included professionalism (e.g., responsiveness, assurance, and empathy), accessibility, basic benefits (e.g., reliability), tangibility, and complementary offers. They indicated a positive effect of attitude toward rural tourism on perceived quality. They also claimed that perceived service quality was positively related to tangibility and complementary offers, but it was not related to professionalism,

accessibility, and basic benefits. Furthermore, Zabkar et al. (2010) argued that there were causal relationships between perceived quality, satisfaction, and the behavioral intentions of tourists in a destination (Baker and Crompton, 2000).

The servicescape is considered as cue of service quality (Reimer and Kuehn, 2005; Olson and Jacoby, 1972). Bitner (1990) referred to how an organized environment in contrast to a disorganized one affected the evaluation of a service failure. Ward et al. (1992) as well as Sirgy et al. (2000) only examined the importance of the exterior and interior servicescapes as cues for categorizing services and forming prototypical impressions. A number of studies on several aspects of the servicescape, such as colour and lightinh, background music, as well as odours (Turley & Milliman, 2000) showed behavioural effects, but were primarily applied to the retail industry and examined only single components. A few more general studies sought to consider the servicescape's overall effect (e.g., Donovan & Rossiter, 1982). The emphasis of these studies was on investigation of direct connections between servicescape factors and behavioural variables (e.g., time spent, amount of money spent). Less attention was paid to the question of how a servicescape affects the evaluation of service quality. However, the SERVQUAL model with five dimensions, remains an instrument used in the tourism and hospitality industries, worldwide.

Our conceptual framework, shown in Figure 1, integrates the pieces of theories from cognitive and environmental psychology (Donovan & Rossiter, 1982; Bitner, 1990; Baker & Crompton, 2000) with Parasuman et al.'s SERVQUAL (1988) and Cronin and Taylor's SERVPERF (1994). Figure 1 shows the structural relations among the five constructs, tangibility, empathy, assurance, responsiveness, and reliability of service quality, in ecotourism.
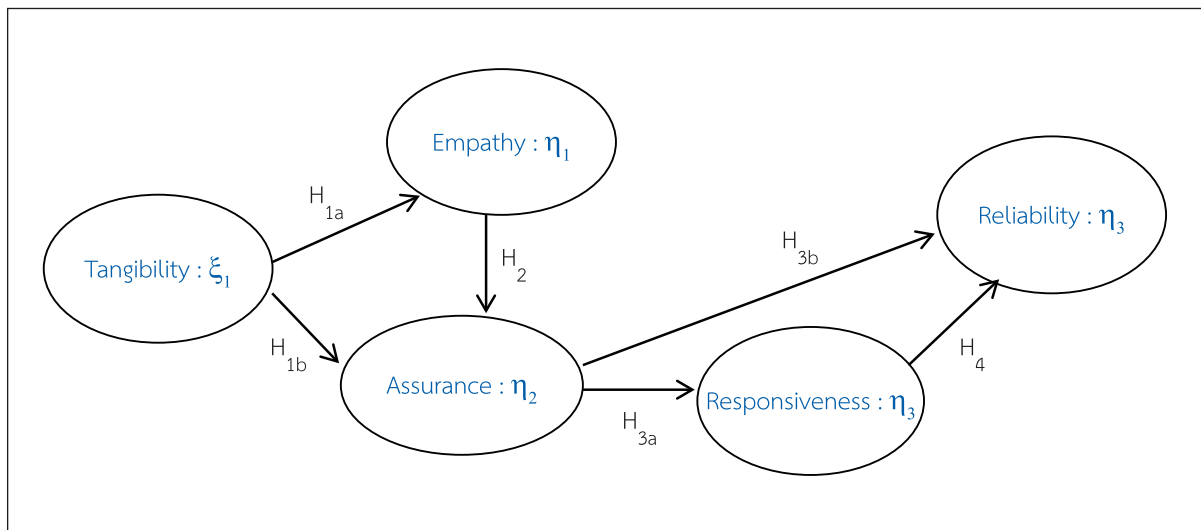
Figure 1 The Ecotourism-Service Quality Model

Research Hypotheses

As, Reimer and Kuehn (2005) examined the effect of the servicescape on quality perception in the dimensions of reliability, empathy, assurance, responsiveness in two service industries (retail banking and restaurants). Additionally, they defined tangibility in SERVQUAL as the servicescape elements which act as search qualities, while the other SERVQUAL dimensions represented experience or credence qualities. They found that the tangibility aspect of the physical surroundings had a causal relationship with the empathy and assurance aspects. Also, Sylvie & orsingher (1998) investigated whether the 22 scale items distinctively represented the five dimensions of service quality defined by Parasuraman et al. (1988). The results showed that one dimension, tangibility, was clearly perceived as following empathy. Additionally, the other three dimensions were confused in the client's mind. Likewise, Bhat (2012) suggested that the SERVQUAL scale for the tourism area consisted of tangibility, responsiveness, reliability, assurance and empathy. Moreover, in Khan's study (2003), the influences of tangible aspects were examined only for the expected quality of the tangibility, but not for the perceived quality of the service itself. The research found that tourists preferred not only environmentally friendliness, but also services that were courteous, informative, and trustworthy. Later research (Akroush et al., 2016) indicated that tourism service quality entailed destination loyalty and image. On the basis of the literature discussed above, the following hypotheses were developed:

H_{1a} : There is a positive relationship between the tangibility and empathy dimensions of service quality in ecotourism.

H_{1b} : There is a positive relationship between tangibility and assurance dimensions of service quality in ecotourism.

Using these five dimensions with adapted 27 items, O'Neill et al. (2000) studied five tour operators in Australia. They claimed that assurance was the most prominent indicator of overall service performance. Kang & James (2004) found that the empathy and assurance dimensions highly correlated with service quality. These arguments led to a further hypothesis:

H_2 : There is a positive relationship between the empathy and assurance dimensions of service quality in ecotourism.

Previous research demonstrated the effectiveness of applying service quality in the tourism industry (Atilgan et al., 2003; Juwaheer & Ross, 2003). For example, Juwaheer & Ross (2003) found that assurance and reliability ranked as the top two dimensions in determining service quality, based on research into the service quality of hotels in Mauritius. Albaccete-Saez & Fuentes-Fuentes (2007) examined

the roles of seven dimensions with an adjusted 26 item scale for rural accommodation service users in Spain. They indicated that, in order of variance explained, these factors were personnel responsiveness, complementary offers, tourist relations, basic demands, tangibility elements, security, and empathy. On the basis of the literature discussed above, the following hypotheses were developed:

H_{3a} : There is a positive relationship between the responsiveness and assurance dimensions of service quality in ecotourism.

H_{3b} : There is a positive relationship between the responsiveness and reliability dimensions of service quality in ecotourism.

Tsaur et al. (2002) used the SERVQUAL model to assess service quality amongst travel agents in Hong Kong. Eight dimensions with an adjusted 36 item scale were used to account for the context of the study. They argued that responsiveness and tangibility were the most important dimensions of service quality in a loyalty model in the hotel sector. Also, Bigne et al. (2003) used the SERVQUAL model to assess service quality amongst tourists in Spain. Five dimensions with an adjusted 22 item scale were used. Large gaps were seen in the dimension of reliability, followed by empathy, responsiveness, and assurance. Structural equation modeling revealed that reliability was the most important dimension in predicting service quality. Likewise, Juwaheer (2004) used this model to assess service quality among international tourists. Nine dimensions with an adjusted 39 item scale were used to assess hotel effectiveness. They indicated that, in order of importance, these factors were the reliability, assurance, extra room amenities, staff communication, room attractiveness, empathy, staff outlook, food and service, and hotel surroundings. Later research (Ruiqi & Adrian, 2009) used the SERVQUAL scale to investigate the service quality of travel agents in Guangzhou, South China, from a customer perspective. The largest gap was in the dimension of reliability. On this basis, the following hypotheses were developed:

H_4 : There is a positive relationship between the assurance and reliability dimensions of service quality in ecotourism.

H_5 : There is a positive relationship between tangibility, assurance and reliability through the empathy and responsiveness in ecotourism.

3. Methodology

The Sample and Data Collection

This research involved a survey design. It included a pilot test using undergraduate students at Udon Thani Rajabhat University, for pretesting questionnaire items. Additionally, this investigation into

reliability, assurance, empathy, responsiveness, and tangibility attributes necessitated uncovering variables of interest in a large-scale field study. From an initial list of 136,955 tourists (Domestic Tourism Statistics, 2016), a sample of 392 individuals was purposively selected (Fritz & MacKinnon, 2007). The sample size is close to ten times the number of free model parameters (Kline, 2006:111; Baumgartner & Homburg, 1996). The data were collected via personal questionnaires. Respondents were asked to rate, on a five-point Likert scale, their agreement or disagreement with particular SERVQUAL dimensions. In January 2016, 392 questionnaires were administered to a sample of domestic tourists.

Measures

A preliminary list of measurement items was generated from a review of the literature related to items of both service quality and ecotourism (Bhat, 2012; Atilgan et al., 2003; Parasuraman et al., 1988; Hwang et al., 2003; Khan, 2003). These items included tangibility (Bhat, 2012), empathy, responsiveness, assurance and reliability. The items were measured using established scales, with the responsiveness options were anchored at 'strongly disagree' (1), and 'strongly agree' (7) (see Table 1).

4. Results

Measurement Model

Before testing the proposed hypotheses, this paper evaluated the psychometric properties of the measurement scales through confirmatory factor analysis using LISREL (Anderson & Gerbing, 1988). In their paper, the composite reliability (CR), variance extracted estimates (AVE), convergent validity, and discrimination were studied. The overall adequacy of the proposed theoretical framework was examined using LISREL 8.30 causal modeling procedures (Joreskog & Sorbom, 1996). Then, the maximum likelihood method of estimation and two-stage testing process were adopted. A substantial portion of the variance in the service quality in ecotourism was explained by the model. The results are shown in Table 1. The model gave a close fit to the data as indicated by the χ^2 (148) value of 226.87 (p<0.00003). However, the ratio of χ^2 and degrees of freedom was 1.53 (226.87/148), with GFI of 0.93, AGFI of 0.90, CFI of 0.99 and RMSEA of 0.04. Therefore, this service quality model can considered acceptable (Bentler, 1990). The CR reflects the internal consistency of the indicators measuring a given factor (Fornell & Larcker, 1981). The composite reliability values for each the SERVQUAL dimension are shown in Table 1. As shown, the CR score for each dimension is slightly high (0.83, 0.84, 0.71, 0.85). Additionally, Cronbach's alpha values for each of the SERVQUAL dimensions are shown in Table 1, which are greater than 0.60 (Bagozzi & Yi, 1988). Fornell & Larcker (1981) suggested that AVEs for a construct should be 0.50 or larger. Most of AVE values are higher than 0.50.

Table 1 Properties of Confirmatory Factor Analysis of Ecotourism

Construct Indicators	Std. Loadings	t-value	CR	AVE	Cronbach's Alpha
Tangibility (*Adapted from Bhat, 2012; Khan, 2003; Bitner, 1992*)			.61	.54	.80
Visually appealing accommodation facilities [Y1]	0.53	-			
A wide car parking spaces [Y2]	0.71	10.47*			
Natural attractions of the destination [Y3]	0.80	8.24*			
Appropriate appearances of sign and mapping [Y4]	0.68	7.54*			
Reliability (*Adapted from Albaccete-Saez & Fuentes-Fuentes, 2007; Parasuraman et al., 1988*)			.59	.50	.82
Performing the services right the first time [Y5]	0.71	-			
Accomplishing something by a certain time [Y6]	0.80	12.29*			
Insisting on error-free records [Y7]	0.78	12.01*			
Responsiveness (*Adapted from Bigne et al., 2003; Parasuraman et al., 1988*)			.63	.57	.80
Telling tourists exactly when services will be performed [Y8]	0.72	-			
Giving tourists prompt service [Y9]	0.70	11.20*			
Being always willing to help tourists [Y10]	0.69	10.96*			
Be never too busy to respond to tourists' requests [Y11]	0.71	11.33*			
Assurance (*Adapted from Hwang et al., 2003, 1988; Chang, 2009*)			.58	.51	.83
Feeling safe in tourists' transactions with the destination [Y12]	0.79	-			
Instilling confidence in tourists [Y13]	0.76	13.14*			
Have the knowledge to answer tourists' questions [Y14]	0.69	11.66*			
Be consistently courteous with tourists [Y15]	0.71	10.84*			

Table 1 Properties of Confirmatory Factor Analysis of Ecotourism (Continued)

Construct Indicators	Std. Loadings	*t*-value	CR	AVE	Cronbach's Alpha
Empathy *(Adapted from Akroush et al., 2016; Reimer and Kuehn, 2005)*			.65	.59	.86
Operating hours convenient to all its tourists [Y16]	0.82	-			
Location convenient to all its tourists [Y17]	0.71	12.38*			
Giving tourists personal attention [Y18]	0.70	12.15*			
Customers' best interests at heart	0.61	10.43			
Understanding specific tourists needs	0.60	10.38			

* Indicates Significance at a P<.01 Level

Besides the reliability test, convergent validity was demonstrated when different instruments were used to measure the same construct. The scores from these various instruments are strongly correlated. Convergent validity can be assessed by reviewing the t-test for the factor loadings (greater than twice their standard error) (Anderson & Gerbing, 1988). The t-test for each indicator loading is shown in Table 1. The result was that the construct demonstrated a high convergent validity because all t-values are significant at the α = .01 level.

Table 2 Test of Discriminant Validity for Ave and Confidence Interval

	Reliability	Responsiveness	Assurance	Empathy	Tangibility
Reliability	0.50	0.04	0.04	0.04	0.03
Responsiveness	(0.14; 0.26)	0.57	0.06	0.04	0.03
Assurance	(0.14; 0.26)	(0.19; 0.31)	0.51	0.08	0.06
Empathy	(0.14; 0.26)	(0.13; 0.25)	(0.20; 0.36)	0.59	0.08
Tangibility	(0.10; 0.22)	(0.12; 0.24)	(0.18; 0.30)	(0.20; 0.36)	0.54

Notes: On the diagonal, the AVE of each factor is shown. In the upper part, the square of the correlation between each pair of factors is detailed and the confidence interval for every pair of factors is presented in the lower part.

Additionally, the confidence interval test to assess the discriminant validity between five factors involved calculating a confidence interval of plus or minus two standard errors around the correlation between these factors, and determined whether this internal included 1.0. If it did not include 1.0, discriminant validity was demonstrated (Anderson & Gerbing, 1988). Table 2 shows the values of interval between two factors. They were 0.26, 0.26, 0.31, 0.26, 0.25, 0.36, 0.22, 0.24, 0.30 and 0.36. That is to say that discriminant validity for the eco-service quality scale is significantly supported since all ranges excluded the value of 1.0.

Structural Model

Structural equation modeling (SEM) was mainly used for data analysis since the proposed model was a simultaneous system of equations having latent constructs (unobservable variables) and multiple indicators. It is a powerful methodology for assessing validity and reliability of marketing constructs (Anderson and Gerbing, 1988). When using the Mplus program (Muthen and Muthen, 1998-2012), an important consideration is to demonstrate that the model is properly identified.

Having analyzed the data, it was observed that the eco-service quality model was a close fit to the data at χ^2 (158) value of 329.34 (p<0.00) (Figure 2). However, the ratio of χ^2 and degrees of freedom was 2.08 (329.34/158) and the comparative fit index (CFI) was 0.95. The Tucker-Lewis index (TLI) was 0.94, the Root Mean Square Error of Approximation (RMSEA) was 0.06 and the Standardized Root Mean Square Residual (SRMR) was 0.04. As such, the eco-service quality model was acceptable for use in this area (Bentler and Bonett, 1980).
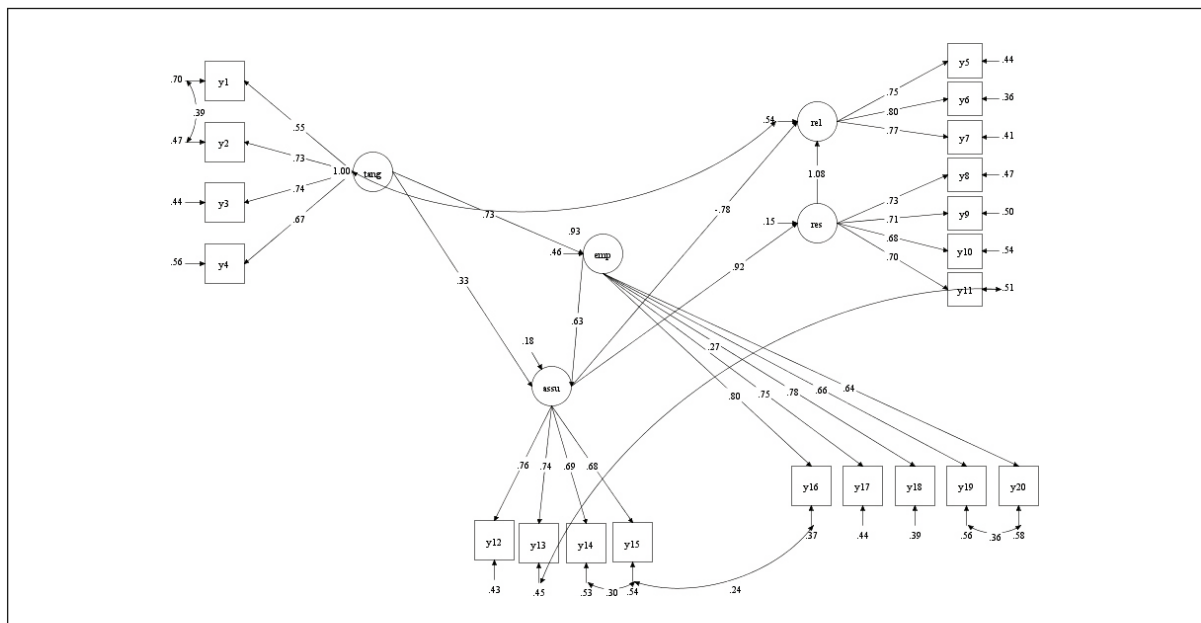
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Figure 2 The Model Estimates

The results of hypothesis testing are provided in Table 3, along with parameter estimates, their corresponding t-values and fit statistics. As shown in Table 3, $H_{1a', b}$, H_2, $H_{3a', b}$ H_4 and H_5 are supported by the data. Specifically, $H_{1a', b}$ suggested that tangibility was significantly related to both empathy and assurance (γ_{11} = 0.73, p<0.01; = γ_{21} = 0.33, p<0.01). Also, H_2 predicted a positive relationship between empathy and assurance (β_{21} = 0.63, p<0.01). Moreover, according to $H_{3a', b}$, there was a positive relationship between reliability, assurance and responsiveness (β_{42} = 0.92, p<0.01; β_{32} = -0.70, p<0.01). Finally, H_4 predicted a positive relationship between responsiveness and reliability (β_{43} = 1.08, p<0.01).

On the basis of these findings, it can be concluded that although empathy and responsiveness play significant mediating roles in the service quality of ecotourism in Thailand, the role of the tangibility in this context remains certain.

Table 3 Hypotheses testing for service quality

Hypothesized Paths		Standardized Coefficients	*t*-value	*p*-value
H_{1a}	Tangibility ⟶ Empathy	0.73	17.10	.01
H_{1b}	Tangibility ⟶ Assurance	0.33	4.19	.01
H_2	Empathy ⟶ Assurance	0.63	8.45	.01
H_{3a}	Assurance ⟶ Responsiveness	0.92	38.55	.01
H_{3b}	Assurance ⟶ Reliability	-0.78	-2.61	.01
H_4	Responsiveness ⟶ Reliability	1.08	3.99	.01

Mediating the Effect of Empathy and Responsiveness

This paper utilized Lau & Cheung's (2012) procedure to assess specific indirect effects in the complex latent variable model. It employed bootstrapping procedures, which facilitated the exploration of mediation in the association between independent focal variables (e.g., tangibility) and dependent variables (e.g., reliability). Thus, 1,000 bootstrap samples at the 95% confidence level were employed.

Table 4 presents output that details the estimated specific mediation effects, along with their Bias-Correctded (BC) bootstrap confidence intervals. The paper first investigated the relationship of Tang ⟶ Emp ⟶ Assu to test whether there were significant indirect effects of empathy on assurance. It showed a significant indirect effect of empathy on assurance ($\beta_{41}\beta_{43}$ = .41, p < 0.01, 95% CI = .25 to .56). Tangibility had a significant direct effect on assurance (β_{31} = .36, p < 0.01, 95% CI = .18 to .62) as the

confidence interval (CI) does not contain 0, indicating a partial mediation. Additionally, the current work also investigated the relationship, Assu → Res → Rel, to test whether there was a significant indirect effect of responsiveness on reliability. It showed a significant indirect effect of assurance on reliability ($\beta_{41}\beta_{43}$ = .94, p < 0.01, 95% CI = .02 to 1.86). Assurance had an insignificant direct effect on reliability (β_{31} = -.16, p > 0.01, 95% CI = -1.07 to .75) as the CI includes 0, indicating no mediation (Lau and Cheung, 2012). Thus, the data supported the H_5 hypothesis, that empathy is the mediator of the relationship between tangibility and assurance, and responsiveness is a mediator of the effect of assurance on reliability.

Table 4 Mediation Analysis

Path	Indirect Effect				Direct Effect				
	Effect	SE	p-value	95% CI	Effect	SE	t-value	p-value	95% CI
Tang → Emp → Assu	.41	.10	.00	.25, .56	.36	.11	3.51	.00	.18, .62
Assu → Res → Rel	.94	.48	.05	.02, 1.86	-.16	.47	-.34	.00	-1.07, .75

5. Discussion and Conclusions

The study aim is to develop and empirically test a conceptual framework to learn how tourists judge service quality in ecotourism. The results show that tangibility influenced empathy and responsiveness, which in turn influenced the assurance and reliability aspects, respectively. The results show that service quality measurement consists of five components including tangibility, empathy, assurance, responsiveness, and reliability. From testing of discriminant validity, not only D-square, but also the confidence intervals and the t-test for the factor loadings (greater than twice their standard error) are acceptable. These findings are supported by the studies of Parasuraman et al. (1988) Albaccete-Saez and Fuentes-Fuentes (2007), Martinez and Martinez (2008) and Bhat (2012).

The result is that the hypotheses are supported. There are positive linkages between tangibility, empathy, assurance, responsiveness and reliability dimensions in ecotourism. Thus, these hypotheses confirm the results of Khan (2003), Kang and James (2004), Bhat (2012), Ruiqi and Adrian, (2009) and Untachai et al. (2011). One explanation for these findings may be that the tangibility of a servicescape is a cue that affects the evaluation of service quality (e.g., Baker and Crompton, 2000; Maestro Hernandez et al., 2007). Ward et al. (1992) and Sirgy et al. (2000) only examined the importance of the exterior and interior servicescape as cues for categorizing services and forming prototypical impressions.

There are positive linkages between the tangibility and empathy, empathy and assurance, responsiveness and assurance, and responsiveness and reliability dimensions in ecotourism. These findings are consistent with the studies of Maestro Hernandez et al. (2007) and Reimer and Kuehn (2005). In Khan's (2003) study, the influence of the tangible aspects were examined only for the expected quality of tangibility, but not for the perceived quality of the service itself. The research found that tourists prefer not only environmental friendliness, but also services that are courteous, informative, and trustworthy. Specifically, promising to do something by certain time and insisting on error-free records are highly important for reliability. This finding is consistent with the research of Juwaheer (2004), Bigne et al. (2003), and Khan (2003). Simultaneously, always being willing to help tourists is of the highest importance, as is being consistently courteous with tourists for the assurance and responsive dimensions, respectively. This finding is consistent with the research of O'Neill et al., (2000) and Juwaheer & Ross (2003). Finally, giving a tourist personal attention and a wide car parking space are of the highest importance for the empathy and tangibility dimensions, respectively. This is consistent with Reimer & Kuehn (2005) and O'Neill & Palmer (2003).

6. Research and Managerial Implications

For a managerial perspective, ecotourism operators who implement strategies in various environmental settings cannot have an ethnocentric view about management imperatives. This study provides some guidelines for entrepreneurs handling service quality structure across the country. For example, the result of the study demonstrates that tangibility has a positive link to reliability through the empathy and assurance dimensions. Operators in the Thai tourism industry should have a marketing manager continuously monitoring customer needs/expectations and competitors' strategies to propose integrated service quality strategies in a timely manner in the market. Additionally, this study found that tangibility is strongly related to empathy. The ecotourism sector should place emphasis on car parking lots, natural attractions, suitable signage and maps of destinations, and give tourists individual attention.

Although this paper provides relevant and interesting insights into the understanding of the components of service quality in the Thai ecotourism industry, the limitations associated with this study should be recognized. First, cross-sectional data were used in the paper. Subsequently, the time sequence of the service quality structure cannot be determined unambiguously. Therefore, the results might not be interpreted as proof of a causal relationship, but rather as lending support for a prior causal scheme. The development of a time-series database and testing of the service quality structural relationship in a longitudinal framework would provide more insight into probable causation.

Second, the conceptualization of service quality structure in ecotourism may be somewhat limited. It is arguable that a service quality structure may consist of more than five dimensions. Future research should examine the impact on tourists' overall evaluation of service quality, their level of satisfaction, their willingness to recommend the destinations to others and their likeliness to return to the same destinations in future.

Third, the LISREL methodology may be construed as a limitation because the results presented here are based on the analysis of a causal non-experiment design. Future research should be conducted in terms of experimental approaches. Finally, this study was limited to one service sector, ecotourism. For further research avenues, future research with similar research objectives should examine more hospitality sectors, such as restaurants, tour operators, car rental services, travel agencies, clubs, and hotels. However, the effects of sampling and sampling sizes within any socio demographic variable must be used with care so they are sufficiently large for predictive validity. Moreover, a qualitative approach should be applied for examination of service quality in tourism.

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