

Online reviews towards reducing risk

Neha Yadav, Sanjeev Verma and Rekha Chikhalkar

Abstract

Purpose – This paper aims to examine the impact of online reviews on behavioral intentions via perceived risk. Perceived risk is both analytical and emotional. Stimulus–organism–response (S–O–R) framework guided this study to explore the interaction between online reviews, perceived risk and behavioral intentions.

Design/methodology/approach – The conceptual model proposed in this research has been validated using confirmatory factor analysis (CFA) and structural equation modeling to assess the measurement model and the validity of the scale, based on primary responses collected from 473 travelers.

Findings – Findings of this study suggest the role of online consumer reviews in reducing the perceived risk associated with experience dominant services like tourism. Process model test proves the mediating role of perceived risk between online reviews and behavioral intentions. Results indicate the significance of online review in lowering the perceived risk leading to positive behavioral intentions.

Practical implications – Destination marketing organizations (DMOs) should understand the role of online reviews in effectively reducing risk and uncertainty, thereby influencing behavioral intentions.

Originality/value – This paper is unique in attempting to empirically examine the mediating role of perceived risk between online reviews and behavioral intentions. The study is a forerunner in using S–O–R framework to test the interaction between online review, perceived risk and behavioral intention.

Keywords Online reviews, Behavioral intentions, Perceived risk, Travel and tourism, Mediation, COVID-19

Paper type Research paper

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1. Introduction

The global pandemic has particularly impacted the future of tourism across the globe in the form of risk perceptions associated with travel (Matiza, 2020). According to Yang *et al.* (2020), tourism demand is inversely proportional to coronavirus disease 2019 (COVID-19). The uniqueness of the global pandemic scenario is that it has affected tourism businesses of countries like China, Germany, Iran, Italy, France, Spain, the USA and the UK (WTTC, 2020). Tourist arrivals and foreign exchange earnings in India have also been affected severely (Jaipuria *et al.*, 2021). Products are search, experience and credence dominant based on ease of evaluation (Nelson, 1970). Products high on search attributes are easy to evaluate and discern before consumption, whereas experience products (services) are difficult to evaluate before consumption. Vacations, parks and hotels are some of the examples of experience dominant products (Krishnan and Hartline, 2001). Lack of search attributes and heterogeneity make services difficult to evaluate (Zeithaml *et al.*, 1985). In services, the lack of search attributes makes the task of consumer decision-making complex and riskier when compared to tangible goods (Krishnan and Hartline, 2001). Decisions related to travel are high-risk decisions due to intangibility and inseparability (Havitz and Dimanche, 1997). Risk perception has been an important construct for driving purchase intention (Bauer, 1960; Dowling and Staelin, 1994). In the tourism context, perceived risk can play a significant role in the travel decision (Sönmez and Graefe, 1998; Lepp and Gibson, 2003). According to Moutinho (1993), perceived risk is an essential determinant of tourist decisions. Travel decisions are high-risk decisions (Havitz and Dimanche, 1997; Moutinho, 1993) and the severity of risk perception can alter the tourist's intention to travel (Sönmez and Graefe, 1998; Lepp and Gibson, 2003).

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Consumers use information sources to reduce risk. Additional information can reduce the risk perception by improving the knowledge level (Zeithaml, 1981). Social networks and media sites (SNM) have been proliferating over the last decade (Farooq *et al.*, 2018). Online reviews posted on social networks and media sites are becoming an extremely critical form of eWOM communication (Sen and Lerman, 2007). These sites are immensely benefitting both consumers and marketers. According to Thoring (2011), online reviews on social networking and media sites are an effective means for generating feedback, gathering consumer insights, branding and publicity, handling business networking and customer relationship management. When a consumer decides to purchase something, especially in the “online” space today, they do tend to look for other consumers’ evaluations, which serve as a generic guideline in their purchase decision process.

Extant literature hinted at the role of online reviews in reducing perceived risk (Mitra *et al.*, 1999; Gottschalk and Mafael, 2017). The COVID-19 pandemic has severely affected the tourism industry. Post-pandemic it was a challenge for tourism marketers to recover the lost public perceptions (Beirman, 2021). Many marketers resorted to creating awareness and managing perceptions by providing information on risk mitigation strategies adopted by them. Risk perceptions were altered to a great extent post the COVID-19 pandemic (Villacé-Molinero *et al.*, 2021). Studies proved that media played a critical role in altering destination images post-pandemic and influencing tourist intentions to visit (Matiza and Slabbert, 2022). Tourists search for external information for making travel decisions (Gursoy and Umbreit, 2004). Gursoy *et al.* (2018) also opined that the extent of risk perceptions attached to traveling to a destination decides on the type of information the traveler refers to, personal or online. More transparent information on the risk factors from the destination marketing organizations (DMOs) improves the confidence among tourists, in turn helping them decide on their travel (Kozak *et al.*, 2007). Receiving authentic information on travel destinations alters the travel plans in various ways; change, delay or cancel (Hajibaba *et al.*, 2015). Communication in various forms (online/personal) plays a critical role in mitigating risk and impacting travel decisions. Therefore, this research aims to find answers to the following questions:

- RQ1. Are online reviews influential in reducing perceived risk among millennial leisure travelers?
- RQ2. Does perceived risk mediate the relationship between online reviews and travel intentions?

The present study uses the lens of stimulus–organism–response (S–O–R) theory (Mehrabian and Russell, 1974), to examine the interaction between online reviews, perceived risk and behavioral intentions. Higher-order multivariate analysis including structural equation modeling and Haye’s PROCESS Model 4 is used to test the relationship. The findings of this study are significant for a new relationship (theoretical building) testing, and practitioners can benefit by incorporating the emergent role in their digital marketing strategy.

The paper has been organized in the following way: the first section introduces the context and need of study, the second section gives a brief review of literature on the constructs and theoretical foundations for research, the third section highlights the methods and results of the study, and the final section covers conclusions and limitations of the study.

2. Theoretical foundations and hypotheses

In this section, the authors provide the details of the theoretical foundation for the proposed model and hypotheses. The theory of S–O–R has been used as a lens to examine the proposed hypotheses. Extant literature has been reviewed on the S–O–R framework, online reviews and risk perceptions in the context of tourism.

2.1 The S–O–R framework

The current research derives its motivation from the S–O–R theory (Mehrabian and Russell, 1974), which was furthered by Jacoby (2002). According to this theory, some environmental cues

manifest cognitive and affective conditions, subsequently resulting in behavioral outcomes (Donovan and Rositer, 1982). Once an individual crosses these affective and cognitive stages, a behavioral response to the stimuli is expected. This internal response projects an individual's attitude, and the external response is depicted by the individual's behavior (Hu *et al.*, 2016). The external cues (stimulus) from the environment pave the way to the internal evaluation state (organism), which in turn leads to positive or negative actions/behavior (response) as an answer to the stimuli (Mehrabian and Russell, 1974).

The first component – a stimulus – is defined as a factor from the environment that influences the affective and cognitive state of an organism (Lin and Lo, 2016). Travel decisions are affected by impulses outside the individual, which includes the influences of other people. The “unseen” or “virtual” forces that people exert on each other in today's times are called social influences. Social influence today is promptly disseminated through various channels, impending a significant impact on millions of similar customers. Tourists often depend on reliable sources to get a feel of their “unknown experience” at a new destination, which helps them reduce uncertainty and build some expectations. Online reviews impact destination trust, and in turn influence travel intentions (Su *et al.*, 2022). The current paper considers online reviews to be a critical stimulus factor that has a significant influence on travel decision-making.

The “organism” is the second component that is either a cognitive or affective aspect of attitude formation and an intervening factor between the stimulus and the response (Kamboj *et al.*, 2018). Existing studies in tourism (Huber and Schlager, 2018; Slovic and Peters, 2006) concluded that risk perceptions acted in two ways: risk as analysis and risk as feelings. Since travel has been considered as a complex social occurrence (Yang and Nair, 2014), travelers need to obtain some necessary information to make the right decision for the journey (Louriero and Ribeiro, 2011). The understanding of this phenomenon finds its roots in the theory of social support by Cohen and Wills (1985). This theory states that individuals rely on social networks to cope with negative events and social support plays an important role in helping a potential buyer cope with stress. Therefore, the current study proposes that in order to cope with the negative consequences of uncertainty leading to risk (organism), customers would actively look for external cues in the form of online reviews (stimulus) (Boyd and Ellison, 2007).

The third component in the S–O–R theory is the response, which refers to the consequences of referring to online reviews before making a travel decision in the form of behavioral intentions (Donovan and Rositer, 1982). One of the major drivers of intentions to travel is risk perceptions (Schroeder *et al.*, 2013). Several studies have examined the effects of it on consumer decision-making (Dowling and Staelin, 1994; Krishnan and Hartline, 2001) and have found that perceived risks associated with destination travel influence the travelers' intention to travel to a greater extent (Lepp and Gibson, 2003; Fuchs and Reichel, 2010; Sönmez and Graefe, 1998).

2.2 Risk perceptions

According to Moutinho (1993), risk can be defined as “a function of uncertainty and consequence”. Schiffman and Kanuk (2000) highlighted two important characteristics of perceived risk, namely, uncertainty and consequences. Further, they suggested that perceived risk is the uncertainty faced by the consumers while buying, when unable to anticipate the results of their buying decision. Laroche *et al.* (2004) found that perceived risk is high in services due to the intangibility factor. According to Dowling and Staelin (1994), the degree of product involvement is a key indicator of the extent to which consumers will indulge in information search. Later, Chaudhuri (2000) proposed that risk could play four different roles in information search: they are (1) risk as antecedent; (2) risk as involvement; (3) risk as consequence and (4) risk as a moderator.

In tourism research, Moutinho (1993) discussed the role of perceived risk in travel behavior and emphasized the relationship between the risk variables to find out the risk perceptions of travelers. Lepp and Gibson (2003) found that risk perception is higher in international tourists who are seeking familiarity than those who are seeking novelty. For a detailed understanding of perceived

risk, risks were classified into different categories in extant literature to plan an appropriate strategic framework for a remedial action plan. [Jacoby and Kaplan \(1972\)](#) worked upon 12 different consumer products and enunciated five risk dimensions associated with them: financial, social, performance, physical, and psychological. [Brooker \(1984\)](#) identified six types of perceived risk and suggested that financial risk and performance risk were the most substantial risk dimensions of all.

2.3 Online reviews and perceived risk

Travel and tourism activities, being high in experience attributes, are subject to more perceived risk. Since the evaluation occurs “during the consumption process” in experience dominant products like travel and tourism, consumers perceive a greater risk and thus resort to the risk reduction strategies. The two most prominent strategies for risk reduction: firstly, reading reviews on travel ([Schukert et al., 2015](#)) and secondly buying travel insurance ([Hsu and Lin, 2006](#)). There has been enough empirical support to establish the relationship between perceived risk and word of mouth (WOM). In the event of consumer perceiving some risk, he or she begins to search for ways to minimize the risk. A perceived risk mitigation strategy is a relevant marketing issue. Risk perceptions lead to distrust amongst the prospective customers that can be mitigated with the help of managing the negative comments posted on the web ([Zhang et al., 2020](#)). When it comes to buying decisions; consumers trust others’ experiences to know the quality of the product, wherein the WOM facilitates to lower perceived risk and influences the sales positively ([Park et al., 2007](#)). The studies state that more the perceived risk in buying a product, the more is the likelihood of referring to WOM ([Dowling and Staelin, 1994](#)). Services are subject to higher perceived risk when compared to products as per “services marketing theory.” Consumers of services use WOM as they are high on experience attributes, and thereby subject to higher risk perceptions. A commonly observed phenomenon among consumers is their high-risk association with a high-priced product; as per the perceived risk theory where [Hsu et al. \(2013\)](#) have also confirmed this. And therefore, consumers rely all the more on WOM to seek confirmation before finalizing to buy high-priced product/s. In the case of low-cost products, furthering the above, [Luo et al. \(2019\)](#) opined that campaigns which were WOM oriented may be highly efficient to propagate underappreciated but high in quality brands. Also, to make a logical decision, consumers try to understand their maximum benefit by evaluating all accessible information to assess the risk they may experience ([Zhang and Li, 2019](#)).

[Dowling and Staelin \(1994\)](#) compared risk reduction to information search. They proposed that it was done to reduce their levels of perceived risk. They postulated that, firstly, people engaged in routine information searches to gain general product class information and, secondly, to reduce the perceived threat to an acceptable level. According to [Lewis and Chambers \(1989\)](#), intangible products such as travel tourism cannot be evaluated before consumption. Hence, the risk involved is higher. Customers depend more on eWOM communication; to negate the risk perceptions of purchasing such products ([Zhu and Zhang, 2010](#)). [Manes and Tchetchik \(2018\)](#) suggested that service industries like hotel, hospitality and travel are plagued by information asymmetry due to inadequacy of consumer evaluation. They opined that the larger the information asymmetry, the larger is the possibility of uncertainty reduction with the help of eWOM. According to [Jalilvand and Samiei \(2012\)](#), the tourism industry is heavily influenced by eWOM. As per [Chatterjee \(2001\)](#), eWOM can effectively reduce product purchase risk and uncertainty, influencing purchase intentions further. There are risk-aversion strategies that consumers employ before making huge purchases ([Amdt, 1967](#)). According to the study, consumers who perceive higher risks are more likely to seek out WOM information. eWOM is, therefore, important in tourism services, which are known to be high-risk and high-involvement purchases ([Bansal and Voyer, 2000](#); [Sotiriadis and van Zyl, 2013](#)). [Srinivasan and Ratchford \(1991\)](#) conducted a study on the role of external search for automobiles. They opined that consumers seek information before making purchases with an intent to reduce perceived risk. The higher is the risk perceived by the consumer, the higher is the probability to depend on WOM for information related to travel ([Xiang and Gretzel, 2010](#)). Therefore, it is proposed that eWOM has a vital role to play in altering the risk perceptions of leisure travelers.

H1. Online reviews have an impact on risk perceptions of leisure travelers.

2.4 Perceived risk and behavioral intentions

Research has recognized the importance of some contributing factors in consumer decision-making, concerning products that are high on experience attributes, i.e. those which cannot be evaluated before consumption (Huang *et al.*, 2009; Sotiriadis and van Zyl, 2013; Xia and Bechwati, 2008). An area of interest that emerged was tourist decision-making. Tourist decision-making has become a critical area of concern for both tourism researchers and practitioners. Previous research has been trying to study the destination choice models and establish essential relationships in this process (Woodside and Lysonski, 1989). Past research has shown that there existed a link between risk perceptions and the likelihood of purchase behavior, especially in the marketing context (Bauer, 1960; Roselius, 1971). Perceived risk plays a critical role in understanding tourist attitudes (Joo *et al.*, 2021). A well-managed risk perception helps in making the tourist experience more memorable and stimulating (Karl *et al.*, 2020). According to Yang and Nair (2014), risk perceptions are a combination of both cognitive and affective with uncertainty and emotion (fear, anxiety) and that risk can be treated as analysis and feeling at the same time. Studies suggest that perceived risk acts as a pertinent antecedent to travel intentions (Hu *et al.*, 2014; Schroeder *et al.*, 2013). Within the paradigm of marketing, risk will influence purchase behavior when there is underperformance (Yeung and Morris, 2006). Several studies examine the effects of risk on consumer decision-making (Dowling and Staelin, 1994; Krishnan and Hartline, 2001) and found that perceived risks associated with destination travel influence the travelers' intention to travel to a greater extent (Lepp and Gibson, 2003; Fuchs and Reichel, 2010; Sönmez and Graefe, 1998). Sharifpour *et al.* (2014) suggested three types of risk related to destination travel – destination-related risk, physical risk and travel-related risk. The perceived health-related risk weakens the tourism demand (Khalid *et al.*, 2021). Zhang *et al.* (2020) studied the impact of the threat of infectious disease on destination image and risk aversion, which led to decreased tourism demand. Noh and Vogt (2013) suggested that lower perceived risks towards traveling to a destination positively influence intentions to travel. According to Sönmez and Graefe (1998), travel risks can alter the destination choice and the intention to travel, hence, a vital aspect in the process of travel decision-making. Also, Reisinger and Mavando (2005) opined that tourist risk perceptions may influence their intentions to travel and the likelihood of visiting a destination.

Therefore, it is hypothesized that

H2. Perceived risk has a negative impact on the behavioral intentions of leisure travelers.

2.5 Online review and behavioral intentions

According to the social influence theory, the most crucial factor that impacts the behavior of an individual is the influence of others (Burnkrant and Cousineau, 1975). According to Amaro and Duarte (2015), in the absence of enough evidence regarding the role of subjective norms on purchase intention, communicability, a different form of social influence, may be said to influence travel purchase decisions. On these lines, Kim *et al.* (2009) suggested that recommendations from friends and family played an important role in reducing the risk associated with travel decisions, as it relieves anxiety. Online reviews play the same function as recommendations from known sources like friends and family, in an online shopping environment (Bae and Lee, 2011; Prendergast *et al.*, 2010). Some past studies have also examined the role of online consumer reviews in reducing the risks associated with a purchase, and thereby stimulating the intentions to purchase (Chatterjee, 2001; Park *et al.*, 2007). This stimulation happens by providing additional information that is useful to the buyer. According to Ruiz-Mafe *et al.* (2018), the process of the impact of online reviews on intentions to purchase can take two routes, either systematic or heuristic, and may produce independent impact. According to Ganesi and Correa (1994), perceptions of risk are higher in the services sector, making the availability of information about the experiences extremely useful in purchase decision-making.

According to past studies, online discussions posit much more reliable and interesting sources of information than any other paid form of information source on the web (Bickart and Schindler, 2001). Park and Lee (2008) found that for consumers who buy high-involvement products for perceived informativeness, eWOM communication has a higher effect on purchase intention than the popularity of a product. Purnawirawan *et al.* (2012) stated that the balance of review valence in terms of positive-negative reviews and the sequencing of the reviews also influence attitudes and intentions. Kamtarin (2012) established that eWOM plays an important role in shaping behavioral intention, while the other two important influencers are perceived value and trust. Studies have suggested that logical and persuasive reviews have a strong positive effect on purchase intention (Park *et al.*, 2007). Further, WOM has been known to play a big role for forming, and then influencing consumer attitudes and behavioral intentions (Chatterjee, 2001; Chevalier and Mayzlin, 2006; Sen and Lerman, 2007; Xia and Bechwati, 2008).

Therefore, it is hypothesized that

H3. Online reviews positively influence the behavioral intentions of leisure travelers.

Yang *et al.* (2016) opined that an important function of online reviews is to overcome uncertainty involved in product purchase and suggested that perceived risk is an important determinant of consumer attitudes. However, they could not find any significant effect of perceived risk on purchase intention in the context of online buying. Yue *et al.* (2017) found that perceived risk played a mediating role in the relationship between media richness and trust in the context of organic food purchases. Despite varied information being available on destination through different information channels, the intangible and experience dominant nature of tourism as a product increases uncertainty to a greater extent, especially in the absence of prior experience (Wang, 2016). Sánchez-Cañizares *et al.* (2021), studied the modulating effects of perceived risk on travel intentions during COVID-19 situations. It would be interesting to investigate the role of online reviews on travel intentions in light of perceived risk associated with the travel decision-making process due to knowledge gaps.

Therefore, it is hypothesized that

H4. Perceived risk negatively mediates the relationship between online reviews and the behavioral intentions of leisure travelers.

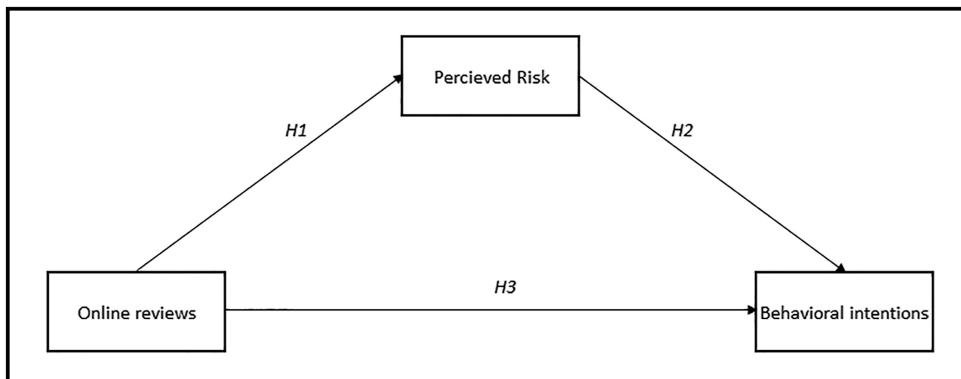
According to Kang (2011), the S–O–R framework may not necessarily follow the sequential route from S to O to R. There are possibilities of the stimulus (S), that is, the external environment, online reviews directly affecting the response (R), behavioral intentions. The research model for this study is presented in Figure 1. It is argued that online reviews impact behavioral intentions and perceived risk. Additionally, perceived risk has a direct effect as well as a mediating effect on behavioral intentions.

3. Methodology

3.1 Sample, data collection and preparation

The target population for the study was millennial (Gen Y) travelers who have traveled for pleasure, recreation and relaxation purposes in the last five years and have referred to online travel reviews before making a travel decision. Social media sites are used extensively by Generation Y for messaging, sharing information and staying in touch with friends (Pempek *et al.*, 2009). For example, Gen Y users visit social media sites for a variety of reasons, including socializing and sharing their travel experiences (Kim and Park, 2020; Moscardo and Benckendorff, 2010). The sampling design for the current study was simple random sampling (SRS). Generally, quantitative studies use SRS (Kelley *et al.*, 2003), which allows the findings to be generalized to a larger population. Data were collected with the help of self-administered questionnaires, collected online with the help of Google Forms. Surveys were sent on various travel communities on social

Figure 1 Research model



networking sites Facebook and Instagram. The present study is a non-interventional survey-based study, where ethical approval is not required. However, ethical considerations guide the methodology and measurements. Participants were informed on research purpose, and prior consent from participants was obtained prior to data collection with assured anonymity. Out of the 780 responses received, 473 surveys were found useable after the data screening and cleaning. Hence, the final sample consisted of 473 participants. Among these participants, 64% were males ($n = 303$); 97% were single (461), the annual household incomes above 12,000 USD were 41% ($n = 195$). The respondents reported in the survey form, their gender, annual household income (in dollars), education and marital status (Table 1).

The questionnaire has two sections: demographic information of the respondents and questions related to their reliance on online platforms for making travel purchases. The researchers conducted the survey online by sending the link to their respective e-mail ids. Participation in the study was limited to respondents in Mumbai and Pune cities in India. Screening questions helped the authors exclude participants who were not born between 1980 and 2000, who had never referred to online reviews before making a travel decision and those who have not traveled in the last five years for pleasure, recreation and relaxation purposes. The respondents were then required to answer the questions about the constructs in the study (see Table 2).

3.2 Measures

The variables in the research model were measured on a five-point Likert scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”. The current research adapted scales from the extant literature. eWOM volume was measured using items from AlMana and Mirza (2013), and Zhang *et al.* (2014). eWOM credibility was measured using items from López and Sicilia (2014), Zhang *et al.* (2014), and West (1994). eWOM argument quality was measured using items from Citrin (2001) and Wixom and Todd (2005). eWOM valence was adopted from the scale of Baur and Nystorm (2017). The items for perceived risk were adopted from Sharifpour *et al.* (2014), and the items for behavioral intentions were adopted from Jalilvand *et al.* (2012), Patterson and Smith (2003), Maxham and Netemeyer (2003) and Wilson and Rodgers (2004).

Multiple iterations were done on the pre-existing scale to remove similar meaning and ambiguous statements and negatively phrased statements to modify the items to the context of the study. Items were also added in some constructs to ensure robustness in measuring the construct. The study also took precautions by removing responses with missing values.

The scale was tested for reliability and validity. Cronbach’s alpha value for individual construct and the scale exceeds the acceptable threshold value of 0.70 indicated at the reliability of the scale.

Table 1 Characteristics of millennial travelers included in this study

<i>Characteristic</i>	<i>Frequency</i>	<i>Percentage %</i>
<i>Gender</i>		
Male	303	64
Female	170	36
<i>Annual household income</i>		
Less than 5 Lakh (6,300 \$ approx.)	100	21
5 to 10 Lakh (6,300 \$ to 12,500 \$ approx.)	178	38
More than 10 Lakh (more than 12,500 \$ approx.)	195	41
<i>Education</i>		
Graduation (Pursuing or Completed)	11	2
Postgraduate (Pursuing or Completed)	422	89
Others	40	9
<i>Marital status</i>		
Single	461	97
Married	12	3

The validity of the scale was tested on three different parameters viz. content validity, concurrent validity and construct validity.

4. Data analysis and results

Confirmatory factor analysis (CFA) was conducted to assess the measurement model and the validity of the scale. Structural equation modeling was conducted using AMOS 20.0, and the maximum likelihood method was used. Mediation analysis was done using the PROCESS tool (Hayes, 2017).

4.1 Measurement model

Items whose loadings were lesser than 0.5 after CFA's first run were removed for ascertaining a better validity of the scale. The measurement model indicated a good fit for the data. Our measurement model ($N = 473$) yielded the following results. The chi-square ($\chi^2 = 524.271$), with a significance value ($p < 0.05$), indicated excellent normed chi-square ($\chi^2/df = 1.956$), less than 3 as recommended. The other goodness of fit (GOF) indices were well within the range, i.e. GOF indices exceeded the minimum adequate value of 0.90 (Hu and Bentler, 1999) (CFI = 0.952, TLI = 0.946 and IFI = 0.952) (Table 3).

The internal consistency measured using Cronbach's alpha was calculated. The reliability of the scales ranged between 0.80 and 0.90, indicating the scales to be highly reliable. The generally agreed upon cut off for Cronbach's alpha is 0.7 (Nunnally, 1994), however, in some exploratory research, it may decrease to 0.6 (Hair et al., 2010).

Further, construct validity was assessed by checking the factor loadings of each item. The average variance extracted (AVE) values above 0.7 are considered very good, whereas, the level of 0.5 is acceptable (Hair et al., 2010). All the values of composite reliability (CR) were above 0.7, and AVE was above 0.5, thus confirming the convergent validity of the constructs. Discriminant validity refers to "the degree of distinctiveness between the constructs" (Hair et al., 2010). As per Fornell and Larcker's (1981) rule to assess the discriminant validity, maximum shared variance (MSV) should be lesser than AVE. Table 4 indicates the results for reliability and validity of the scales used in the study.

The study first tested the adequacy of the proposed measurement model consisting of 3 factors. It showed good fit (CMIN/DF = 1.956, CFI = 0.952, RMSEA = 0.04). Then we checked other alternative models. In the first alternative model, we combined the variables eWOM and BI. The model fit got worse (CMIN/DF = 2.058, CFI = 0.871, RMSEA = 0.047). Finally, we combined all factors (eWOM, PR and BI) to make it a 1-factor model and found the indices to worsen further (CMIN/DF = 2.339, CFI = 0.837, RMSEA = 0.053). This means that the multi-factor model has

Table 2 Variables and references

<i>Latent variable</i>	<i>Observed variables</i>	<i>References</i>
Online reviews	<p>I preferred positive reviews for making my travel decisions</p> <p>Travel destinations having more number of positive reviews were considered favorable</p> <p>My perception of travel destination changes if there are only positive or negative reviews</p> <p>Positive or negative reviews changed my travel preferences</p> <p>The more contrasting online reviews are, the more likely I believe</p> <p>Online reviews separate facts from opinions</p> <p>People who post reviews are reliable</p> <p>I feel online reviews are fair</p> <p>The online travel reviews are</p> <ul style="list-style-type: none"> ■ Correct ■ Reliable ■ Accurate ■ Relevant ■ Timely ■ Up to date 	<p>AlMana and Mirza (2013)</p> <p>Zhang <i>et al.</i> (2014), López and Sicilia (2014)</p> <p>Citrin (2001), Wixom and Todd (2005)</p> <p>Baur and Nystorm (2017)</p>
Perceived risk	<p>Online travel reviews indicated me of potential health related issues at the destination</p> <p>Online travel reviews made me aware of the problems related to safety</p> <p>Online travel reviews help to understand the chances of accidents at a destination</p> <p>Online travel reviews made me aware of the problems related to food</p> <p>Online travel reviews helped me to understand the possible natural disaster at the destinations</p> <p>Online travel reviews helped me to overcome possible communication difficulty during the tour</p>	<p>Sharifpour <i>et al.</i> (2014)</p>
Behavioral intentions	<p>After reading the reviews, I developed positive feelings about the travel destination</p> <p>I am likely to refer to online reviews next time I intend to go for leisure travel</p> <p>I prefer online reviews over other media to know about a leisure travel destination</p> <p>I am likely to refer others to use online reviews if they plan to go for leisure travel</p>	<p>Patterson and Smith (2003), Maxham and Netemeyer (2003) Wilson and Rodgers (2004)</p>

Table 3 Model fit indices for CFA

<i>Indices</i>	χ^2	χ^2/df	<i>CFI</i>	<i>IFI</i>	<i>TLI</i>	<i>RMSEA</i>	<i>SRMR</i>
Model GOF	7167.581	1.816	0.952	0.952	0.946	0.045	0.030

Note(s): CFI – comparative fit index, IFI – incremental fit index, TLI – Tucker–Lewis index, RMSEA – root mean square error of approximation, RMR – root mean square residual

shown a better model fit. Hence, the model has overcome the common method bias, and the constructs were discreet.

4.2 Structural model

Figure 2 shows the overall explanatory power of the model. The structural relationships are indicated by the path coefficients and their significance values. As indicated, all hypotheses (H1–H3) were supported by the data.

The GOF statistics also shows that the structural model fits the data reasonably well. The three-factor model produced a χ^2 of 524.271 (df = 268, $p = 0.000$). The model also produced ($\chi^2/\text{df} = 1.956$), less than 3 as recommended. The other GOF indices were well within the range that is associated with good fit, i.e. GOF indices values exceeded the minimum adequate of 0.90 (Hu and Bentler, 1999) (CFI = 0.952, TLI = 0.946 and IFI = 0.952) indicating the structural model to be a reasonable fit. The structural model assesses the overall explanatory power of the model with the help of path coefficients and their significance values. The GOF statistics shows that the structural model fits the data well.

Table 5 provides the results for the test of significance for all the relationships between the variables in the existing model. All three relationships were found to be significant at an α level of 0.001. Online reviews were found to have a significant positive impact on perceived risk, with $\beta = 0.890$, $t = 7.206$, $p < 0.001$. Perceived risk also had a strong positive impact on behavioral intentions ($\beta = 0.267$, $t = 4.922$, $p < 0.001$). Online reviews also had a positive effect on the behavioral intention, with $\beta = 0.744$, $t = 6.370$, $p < 0.001$.

4.3 Mediating effects

Bootstrapping for a resample of 5,000 was implemented to estimate the indirect effects between the variables and to also test the significance by using confidence intervals. A non-zero range of confidence interval at 95% meant that the indirect effect is statistically significant, indicating a mediating effect of the variable (Ismail, 2017).

Table 6 shows the mediating effects of perceived risk on the relationship between online reviews and behavioral intentions. The model generated produced an indirect effect that was found significant with a point estimate of 0.2477. The bias-corrected lower and upper limits of confidence interval were 0.1412 and 0.3568 indicating a no zero in between the intervals; therefore, perceived risk mediates the relationship between online reviews and behavioral intentions.

Table 4 Reliability and validity results

	CR	AVE	MSV	MaxR(H)	eWOM	PR	BI	Cronbach's alpha
eWOM	0.833	0.561	0.415	0.890	0.749			0.851
PR	0.892	0.580	0.308	0.944	0.555	0.762		0.891
BI	0.874	0.583	0.415	0.960	0.644	0.552	0.763	0.871

Figure 2 Validated model

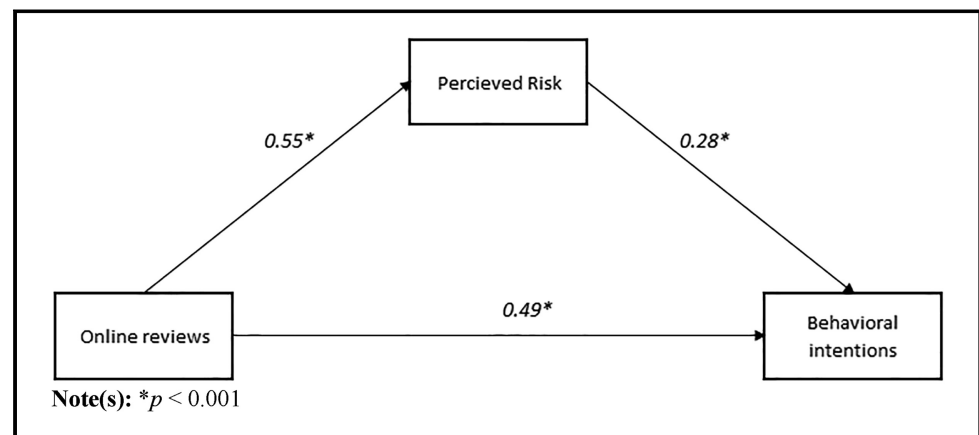


Table 5 Summary of maximum likelihood estimates for the research model (n = 473)

Hypotheses	Path estimates	t-values	Test results
Hypothesis 1 (H1) : Online reviews influence risk perceptions of leisure traveler	0.89	7.206	Accepted
Hypothesis 2 (H2) : Perceived risk influences behavioral intentions of leisure traveler	0.267	4.922	Accepted
Hypothesis 3 (H3) : Online reviews influences the behavioral intentions of leisure traveler	0.744	6.37	Accepted

Table 6 Indirect and direct effects and bootstrapping results for the hypothesized model

Effect	SE	T	p	LLCI	ULCI
Direct effect of online reviews on behavioral intentions					
0.8967	0.0498	14.5982	0.0000	0.776	1.2423
Effect	Boot SE	Boot LLCI	Boot ULCI		
Indirect effect of online reviews on behavioral intentions					
Perceived risk	0.2477	0.0552	0.1412	0.3568	
Hypotheses	Effect	Significance ^a	Test results		
Hypothesis 4 (H4): Perceived risk will mediate the relationship between online reviews and behavioral intentions of leisure travelers	0.8967	0.000	Accepted		
Note(s): Mediator, perceived risk, dependent variable, behavioral intentions					
^a significant level <0.001					

The total effect is 1.1444, with 0.0000 *p*-value <0.001, significant and direct effect is 0.8967 with significant *p*-value 0.0000 < 0.001, at a lower and upper limit of confidence interval of 0.7760 and 1.0174. It was therefore confirmed that there exists a partial mediation of perceived risk in explaining the relationship between online reviews and behavioral intentions. Thus, [hypothesis 4](#) was accepted.

5. Discussion

The present study aimed to investigate the mediating role of perceived risk in the relationship between online reviews and the travel intentions of tourists. S–O–R framework guided the study. Higher order multivariate analysis like structural equation modeling helped in CFA to assess the measurement model and the validity of the scale. CFA analysis findings confirmed the reliability and validity of the measurement scale. All the prescribed norms for scientific validation of scale ([Nunnally, 1994](#); [Hair et al., 2010](#); [Fornell and Larcker, 1981](#)) were found satisfactory and passed to the screening for further analysis of data for testing the hypothesis. Mediation analysis helped in testing the hypothesis with the help of PROCESS Model 4 ([Hayes, 2017](#)).

Results supported all the hypotheses. The online review was found to influence both perceived risk and behavioral intention. Findings also supported the hypothesis about interaction among online reviews, perceived risk and behavioral intentions. PROCESS Model 4 was used to test the mediation of perceived risk between the online review and behavioral intentions. Our study supports the existing literature that suggests a mediating role of risk perceptions in stimulating the intentions to purchase ([Chatterjee, 2001](#); [Park et al., 2007](#)). We conclude that in the S–O–R framework, stimulus (S) can directly lead to response (R), if the stimulus is positive. Also, the alternate path via perceived risk holds in influencing behavioral intention. Results confirmed that

perceived risk mediates the relationship between online review and behavioral intentions. Interaction between the online review and perceived risk contributes to behavioral intentions.

5.1 Theoretical implications

The present study offers a multitude of theoretical and managerial implications. Firstly, the study establishes that online reviews are positively associated with the behavioral intentions of leisure travelers. Secondly, the study claims to be the first attempt in establishing the role of perceived risk as a mediator in explaining the relationship between online reviews and the behavioral intentions of travelers. Our results show that online reviews have a significant effect on perceived risk and indirectly lead to behavioral intentions, particularly in the travel and tourism industry. Besides, we also showed that online reviews have a strong direct impact on behavioral intentions.

The present study empirically examines the impact of online reviews on the travel intentions of individuals belonging to the millennial or Gen Y population. The study results offer an understanding of how online reviews contribute to risk perceptions related to travel and resultant travel intention among millennials travelers. Other consumer segments may assess perceived risk different than the millennials. The present study also tested the interactive effect of perceived risk between the online review and behavioral intention. Findings suggest that the influence of online reviews on behavioral intentions would be more effective in the presence of perceived risk. Extant literature examining the application of the S–O–R framework in the context of online reviews is scarce. The present study contributed to the existing literature in establishing online reviews as an important stimulus to reduce risk perception associated with experiencing dominant services like tourism. Looking at these relationships from the S–O–R lens is a novel contribution to the body of knowledge and can act as a significant gateway for future researchers.

5.2 Managerial implications

It is critical for DMOs to understand the impact of risk perceptions related to travel, the tourist perceptions of safety and travel intentions. The risk perceptions have a significant effect on tourists' intentions to travel and the probability of visiting a destination, more so in times of global pandemics. These findings are critical to understanding the marketability of tourist destinations and providing specific destination characteristics critical to tourists. The DMOs can encourage potential tourists to travel by decreasing the risk perception of the travel destination by effectively creating a positive conversation about the destination. Travelers refer to online content via Web 2.0 for information seeking and travel decisions to plan during various stages in travel decision-making. Marketers can make use of Web 2.0 to create positive sentiment among travelers to build strong destination preferences. For travelers to ensure that their hosts are taking the pandemic seriously, the hospitality industry is taking all necessary precautions to protect their guests and employees during the COVID-19 pandemic; it is important that more organically generated testimonials in the form of online reviews be provided to prospective travelers (Teeroovengadum *et al.*, 2021). Reduced occupancy, frequent disinfecting, digital keys and check-in, and 24-h vacancy between guest departures are examples of such measures. Most importantly, destinations, hotels and airlines should ensure that all relevant information about their safety protocols and measures is provided in all marketing efforts officially and clearly.

5.3 Limitations and future research directions

No research is ever able to cover all attributes and angles and therefore has limitations, but these limitations also provide a good scope for future research as well. A WOM communication has multiple meanings that could be deciphered through exhaustive literature; mostly centered on not just cognitive; but also, affective and conative attributes (Lang and Hyde, 2013) which can be further explored in the context of travel and tourism. Other components that researchers can dwell upon is the role of moderators and mediators that influence travel intentions not just for pleasure

and relaxation but for recreation as well. Positive reviews are more attractive; however, mixed reviews have a significant impact on purchase intention. Future investigation into the type of reviews and their impact on intentions may offer interesting insights. Given the importance of eWOM on destination trust, it would also be interesting to explore the possible relationships between perceived risk in altering the trust in destinations under the influence of online reviews. This study focused on leisure travel; however, future researchers can explore the interactive effect of online review and perceived risk in medical, adventure or spiritual tourism. The present study used a cross-sectional research design, and ad-hoc analysis of various periods before, during and after pandemics can be fruitful in understanding the role of online reviews in reducing risk. Future researchers may also explore the role of consumer characteristics like gender and marital status in processing online reviews for risk reduction. It is also suggested to study the valence of online reviews and their impact on perceived risk, in turn on behavioral intentions to travel.

6. Conclusion

The current study aimed at examining the impact of online reviews on behavioral intentions. Stimulus in the form of reviews in an online environment is proposed as an instrument to reduce the perceived risk (organism) for building a positive response in the form of behavioral intention. Past researchers have investigated the role of perceived risk in varied contexts such as business-to-business (Paulssen *et al.*, 2014; Zhang and Li, 2019), online retailing (Gautam and Sharma, 2019), vacations (Sözer, 2019) and green product purchases (Chen and Chang, 2012). Chaudhuri (2000) discussed the multitude of roles that perceived risk may play based on product involvement and eventually indulging in information search. Previous research suggested the role of information in making travel decisions and the significance of online sources as information sources. However, the significance of online review in the form of opinions, and recommendations in reducing perceived risk and culminating into behavioral intentions needed attention. The present study drew its motivation from the unaddressed research gap and aimed at exploring the role of online review in reducing the perceived risk that leads to positive behavioral intention. Risk is a multidimensional construct and may have varied impacts on traveler decision-making (Carballo *et al.*, 2017). Post-pandemic, travelers are even more cautious about travel planning and hence, there is an imperative significance of online reviews in influencing their travel behavior.

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