Predictors of Hotel Guests' Water Conservation Intention in South Africa

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Abstract

Purpose: South Africa is a water-scarce country and efforts to conserve water should focus on both demand and supply management. The study that directed this article, investigated the predictors of water conservation intention by hotel guests by extending the Theory of Planned Behaviour (TPB). Two constructs (environmental concern and water conservation activities in everyday life) were added to the TPB to develop a unique model of predictors of water conservation intention by hotel guests. The indirect effect of environmental concern was also examined.

Methodology: The study followed a quantitative research design. The cross-sectional survey method was used for data collection from hotel guests and the Partial Least Square Structural Equation Modelling (PLS SEM) was used for data analysis.

Findings: The findings of the study indicated that the extended TPB model is useful in predicting the water conservation intention of hotel guests. In addition, attitude, perceived behavioural control and water conservation activities in everyday life mediate the relationship between environmental concern and intention.

Research implications: Theoretically, the study developed and tested a unique model of water conservation intention by extending the TPB. Managerial implications that focus on both management and guests are discussed.

Originality: The study developed and tested a unique model of predictors of water conservation intention by extending the TPB with two constructs and examining the mediation effect.

Keywords: water conservation; intention; Theory of Planned Behaviour; predictors; hotels; guests

Introduction

Tourism was one of the largest and fastest growing industries worldwide before the Covid-19 pandemic affected the movement of people locally and internationally in 2020 (Rogerson and Rogerson 2020). The tourism industry contributed 10.4% of the world's total gross domestic product (GDP) and accounted for one in 10 jobs globally in 2019 (World Travel and Tourism Council 2020). The tourism industry makes a significant contribution to the South Africa economy. The total contribution of the tourism industry to the GDP of South Africa was 8.2% in 2018. In addition, tourism accounted for 9.2% of the number of people employed in South Africa in 2018 (World Travel and Tourism Council 2019). Despite the major contribution of tourism to employment and economic growth, the industry also exerts significant pressure on the environment through the consumption of resources such as energy and water (Han and Yoon 2015). The majority of the negative environmental effects that conventional hotels have on the environment can be attributed to the excessive consumption of disposable products, energy and water (Saez-Fernandez, Jiménez-Hernández, and Ostos-Rey 2020; Untaru et al. 2016).

Fresh water is one of the important sources of water for tourism, as it is consumed for hygienic purposes such as the flushing of toilets and bathing. It is also used to wash bed and table linen, fill up swimming pools, cook food and irrigate gardens. Generally, the direct water use in hotels is between 84 and 2 425 litres per guest per day (Gössling 2015; Gössling et al. 2012). While water demand is expected to increase, water supply will reduce in many countries because of the depletion of non-renewable fossil water resources and climate change (Mancosu et al. 2015). South Africa is a water-scarce country and is currently overexploiting its renewable water resources. The country needs to implement water conservation measures because of predictions of chronic water shortages by 2050 (Donnenfeld, Crookes, and Hedden 2018; Wade et al. 2014). Therefore, the efficient use of water is a key sustainability challenge for South Africa in general and the tourism industry in particular.

One of the major reasons for the high level of water consumption in the hospitality sector is the behavioural tendencies of guests. Many hotel guests have a "pleasure behaviour approach" to water use, especially when showering, and the hedonic nature of tourism is one of the barriers to sustainable consumption (Gabarda-Mallorquí et al. 2020; Untaru et al. 2016). Because of the increasing level of awareness of the importance of sustainable water management systems, many hotels have implemented strategies to reduce water consumption. However, such a strategy needs the support and participation of guests (Budovska, Delgado, and Øgaard 2020; Dimara, Manganari, and Skuras 2017). Water conservation can be defined as activities that lead to a reduction in the demand for water through improved efficiency of its use and a decrease in losses and waste (Kumari and Singh 2016). Dolnicar, Hurlimann, and Grun (2012) point out that, to ensure a country's long-term water supply, it is important to use both supply-side measures such as water augmentation through water recycling, and demand-side methods such as water conservation. Because of the growing number of people without

access to water, the dwindling water supply worldwide and the need for sustainable tourism, it is necessary to understand the factors that influence consumers' water conservation behaviour (Budovska et al. 2020).

The three most commonly used theories in the domain of environmental psychology are the Norm-Activation-Theory (NAT) (Schwartz and Howard 1981), the Theory of Planned Behaviour (TPB) (Ajzen 1991), and the Value-Belief-Norm Theory (VBN) (Stern 2000). This is because the two major causes of pro-environmental behaviour are self-concept and self-interest. A positive self-concept is related to the moral norms of an individual, while self-interest maximises personal utility and explains why individuals are willing to change their behaviour because of some tangible benefits. Researchers that attribute the environmental behaviour of individuals as being motivated by self-concept, tend to use the NAT and the VBN. However, researchers who focus on self-interest motives and that the sustainable actions of an individual are a result of a rational evaluation of costs and benefits (effort, social approval, time), tend to rely on the TPB (Egea and Frutos 2013; Grazzini et al. 2018). The TPB is more adaptable to tourism and is more commonly used as the theoretical basis of empirical studies on eco-friendly intention and behaviour in the hospitality industry (Chaudhary et al. 2017; Wang et al. 2016). The TPB has three constructs (attitude, subjective norms and perceived behavioural control) and new variables can be added to the theory if they will lead to an improvement in the explanatory power of the model (Ajzen 1991).

Han et al. (2018) remark that the recent line of empirical research in tourism and hospitality is that the environmentally responsible decision-making process of individuals can be influenced by environmental concerns. However, the findings of empirical research are inconclusive about whether the effect of environmental concern on pro-environmental intention is direct or indirect. In addition, green habitual behaviour or environmentally friendly activities in everyday life have emerged as a significant predictor of pro-environmental intention (Han 2015).

Therefore, this study had three objectives: 1) to investigate how the three constructs of the TPB model will affect hotel guests' intention to conserve water; 2) to examine how the extended TPB model, that includes environmental concern and environmentally friendly activities in everyday life, have an effect on hotel guests' intention to conserve water; and 3) to investigate if the three TPB constructs and environmentally friendly activities in everyday life will mediate the relationship between environmental concern and intention to conserve water. The study that directed this article has theoretical, empirical and practical significance. Theoretically, the study tested the usefulness of the TPB and a unique extended model in explaining hotel guests' intention to conserve water. Empirically, the study extended water conservation research in the tourism industry, especially from the perspective of developing countries where studies have been relatively sparse. Practically, understanding the determinants of the water conservation intention of hotel guests is vital to sustainable tourism.

In addition, South Africa is a water-scarce country and a signatory to the Paris Agreement on climate change. (United Nations Framework Convention on Climate Change 2015). Understanding the determinants of water conservation in the hospitality industry can help to reduce water demand and avoid the anticipated chronic water shortages in South Africa by 2050. Furthermore, reducing water use in the hospitality sector will diminish the exploitation of resources and contribute positively to climate change.

The paper is organised as follows. The literature review and development of hypotheses will be done in section two. The research methodology will be explained in section three. The results will be presented in section four. This will be followed by the discussion and conclusion in sections five and six respectively.

Literature Review and Development of Hypotheses

Water Conservation in Hotels

Kumari and Singh (2016) define water conservation as any beneficial reduction in water use, loss or waste. It is the process of saving water for future utilisation. The rationale for water conservation includes: 1) sustainability to ensure the availability of water for future generations; 2) energy conservation to reduce water pumping and delivery that normally consume a significant amount of energy; and 3) habitual conservation to reduce water use and preserve fresh water habitats. Water conservation is vital to the health of the ecosystem, biodiversity, life of human, aquatic and terrestrial organisms, and the livelihood of farmers, fishermen and individuals economically involved in tourism.

According to Han and Hyun (2018), water conservation is one of the most effective environmentally responsible practices in hotels and can bring benefits in the form of environmental and operational cost savings. Water conservation in hotels can be achieved through the replacement of existing appliances with water-efficient ones or a recycling system; and these are usually done by hotel management. Another effective way to achieve water conservation in hotels is to reduce guests' water consumption (Untaru et al. 2016). The use of water by guests occurs in the bathrooms of hotel rooms and involves activities such as showering, brushing of teeth and flushing of toilets. These activities are under the control of hotel guests. In order to achieve maximum water conservation, both hotel management and guests must be committed to water waste minimisation. Hotel management can help to conserve water by promoting best practices and installing the necessary equipment; and guests by behaving responsibly during their stay. Therefore, the active engagement of guests is essential for effective water conservation in hotels and it is important to understand the factors that drive guests' water conservation behaviour (Gabarda-Mallorquí, Fraguel, and Ribas 2018).

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) extends the Theory of Reasoned Action (TRA) (Ajzen 1991; Ajzen and Fishbein 1980). According to the TRA, intention forms the basis for actual behaviour. Intention is dependent on two factors, which are attitude and subjective norms (Ajzen and Fishbein 1980). The TPB also argues that intention determines the performance of a specific behaviour by an individual. However, intention is dependent on three factors, namely attitude, subjective norms and perceived behavioural control (Ajzen 1991). Attitude towards a behaviour is the extent to which an individual positively or negatively evaluates a behaviour. Subjective norms describe the possibility that an important individual, who is valued by an individual, will approve or disapprove of a behaviour. Perceived behavioural control describes the perceived difficulty or ease that an individual has in the performance of a behaviour (Ajzen 1991). The TPB has been used as the theoretical framework by studies on sustainable intention and behaviour (Bashir et al. 2019; Qi and Ploeger 2019). The conceptual framework of this study is based on the TPB because it provides a model that allows for the formation of hotel guests' intention to conserve water, that considers both volitional and non-volitional factors.

Attitude and Water Conservation Intention

The positive attitude of an individual towards a particular behaviour reinforces his/her intention to perform the behaviour (Ajzen 1991). Sun and Willson (2008) point out that conceptually, there are two types of attitude. These are general attitude and specific attitude. A general attitude can be used to explain the general tendency to engage in certain behaviours, while a specific attitude is a relatively strong way to predict a single behaviour. However, a general attitude is likely to influence the formation of a specific attitude. The two types of attitude have been examined in research on intention formation, however, specific attitude is more useful to green behavioural intention. While general attitude represents judgements about environmental problems, specific attitude refers to the evaluation of a particular type of ecologically friendly product, service or behaviour (Nguyen et al. 2019; Zhang et al. 2019). According to Untaru et al. (2016), the findings of empirical studies that have considered general attitude towards conservation, rather than specific attitude, have been of limited use in the development of conservation interventions directed at changing behaviour.

The literature is not conclusive about the effect of attitude on intention. Han, Hsu, and Sheu (2010) tested the applicability of the TPB to the formation of intention to visit green hotels based on 428 respondents who were general lodging consumers in the United States of America (USA). The findings indicate a significant positive relationship between attitude and intention to stay in green hotels. Maichum, Parichatnon, and Peng (2016) examined the purchase intention of green products by consumers in Thailand, based on a study of 483 respondents. The findings reveal that attitude towards the purchasing of green products is positively associated with the intention to purchase green products. Zhang et al. (2019) in a Chinese study of 223

respondents, found that attitude towards green products had a significant positive relationship with the purchase intention of energy efficient household appliances. In the context of water conservation by hotel guests, Untaru et al. (2016) tested the applicability of the TRA to predict hotel guests' intention to conserve water in Romania. Based on a sample of 354 respondents, the findings indicate that attitude towards water conservation behaviour is positively associated with guests' intention to conserve water. Peren and Yang (2015) used the TPB to investigate the intention of consumers to engage in water conservation at home, based on a survey of 174 individuals in Greece. The findings show that the effect of attitude is insignificant. Based on theoretical persuasion and prior empirical findings, it is hypothesised that:

Hypothesis 1: Attitude towards water conservation is positively associated with hotel guests' intention to conserve water.

Subjective Norms and Water Conservation Intention

Social trust, knowledge of what is done by other people and social integration can play a significant part in eco-friendly behaviour such as energy conservation (Sweeney, Soutar, and Mazzarol 2014). The findings of empirical studies on the relationship between subjective norms and intention in the context of eco-friendly goods and services are inconclusive. Han et al. (2010) found a significant positive relationship between subjective norms and intention to stay in green hotels. The findings of Maichum et al. (2016) indicate that subjective norms are positively associated with the intention to purchase green products. Untaru et al. (2016) found a significant positive relationship between subjective norms and hotel guests' intention to conserve water. Zhang et al. (2019) found that the relationship between subjective norms and purchase intention of energy efficient household appliances was insignificant. Han and Hyun (2018), in a study on the factors influencing water conservation of hotel consumers in the USA, found that both descriptive and injunctive social norms had positive but insignificant relationships with water conservation intention. The opinion of an important person or group on conservation may influence the intention of a guest to conserve water. It is hypothesised that:

Hypothesis 2: Subjective norms have a positive effect on guests' intention to conserve water.

Perceived Behavioural Control and Water Conservation Intention

Zhang et al. (2019) remark that perceived behaviour control is reflected by aspects such as perceived inconvenience, cost, time and resources. The findings of empirical studies on the relationship between perceived behavioural control and intention to purchase green products are inconclusive. Maichum et al. (2016) found a significant positive relationship between perceived behavioural control and purchase intention for green products. Nguyen et al. (2019) tested the applicability of the TPB in explaining consumers' green product purchase intentions in Vietnam. The findings indicate a

significant positive relationship between perceived behavioural control and intention. Wang et al. (2016) found a significant positive relationship between perceived behavioural control and intention to purchase organic clothing and energy efficient household appliances in China. Arvola et al. (2008) found an insignificant effect of perceived behavioural control on intentions to purchase organic pizza and apples. The perceived ease of water conservation by guests will positively affect the intention to conserve water. It is hypothesised that:

Hypothesis 3: Perceived behaviours control is positively associated with guests' water conservation intention.

Extension of the TPB in the Context of Eco-friendly Behaviour

Table 1 depicts some studies that have extended the TPB in the context of eco-friendly consumption and behaviour. This study used water conservation activities in everyday life and environmental concern to extend the TPB.

Table 1: Extensions of the TPB				
Author and country	**Purpose**	**Variables used to extend TPB**	**Methodology**	**Findings**
Lam (2006) Taiwan	The study examined predictors of water conservation intention using the TPB.	Perceived moral obligation and perceived water right	Survey of 244 government employees	Perceived water rights and TPB variables affect the intention to install water efficient appliances.
Chen and Tung (2014) Taiwan	The TPB extended to predict intention to visit green hotels	Environmental concern and perceived moral obligation	Data collected from 559 respondents. Structural equation modelling used for data analysis	Environmental concern positively affects TPB variables.
Perren and Yang (2015) Greece	Psychosocial and behavioural factors affect water saving intention at home	Information exposure and current engagement in water saving actions	Hierarchical regression analysis	Intention to save water is determined by engagement in water-saving behaviour
Chaudhary et al. (2017) USA	Extension of the TPB for water conservation among extension clients	Personal norms, demographic factors, and past behaviours	Survey used for data collection. hierarchical linear regression models used for data analysis	Extended TPB predicts water conservation.
Wang et al. (2016) China	Extended TPB to predict intention to visit green hotels in China	Perceived consumer effectiveness and environmental concern.	Data collected from 324 respondents in a survey. Structural Equation Modelling used for data analysis.	Perceived consumer effectiveness and environmental concern positively affect the intention of consumers to visit green hotels
Bashir et al. (2019) Malaysia	Extended TPB to predict the behaviour of consumers in green hotels	Personal norms, intention towards green hotels, environmental consciousness, and green consumer behaviour	Data collected from 394 lodging consumers. Structural equation modelling used for data analysis	Personal norms and behavioural intention positively affect green behaviour.
Warner and Diaz (2020) USA	Extended TPB used to predict water conservation programme	Connectedness to water	Data collected from 3 596 residents. Multiple regression used for data analysis.	Connectedness to water increased the predictive power of the TPB
Arya and Chaturvedi (2020) India	Extending the TPB to explain energy saving behaviour	Consideration for future consequences	Data collected online from college students. Regression analysis used for data analysis.	Extended TPB predicts energy saving behaviour

Water Conservation Activities in Everyday Life and Water Conservation Intention

Water conservation activities or behaviour includes understanding the reason for saving water, reduction in losses and waste and having water-saving behaviour every day. These activities that are done by individuals at home every day and may become habitual, include turning the water off during brushing of teeth and turning the shower off when soaping (Sarabia-Sánchez, Rodriquez-Sánchez, and Hyder 2014). These eco-friendly habitual behaviours are a significant predictor of pro-environmental intention/behaviour (Han et al. 2018. The findings of the study by Han et al. (2010) show that environmentally friendly activities of hotel guests at home are positively related to their pro-environmental purchasing decision. In addition, hotel guests' high level of environmentalism in everyday life improves the intention to reuse towels (Dimara et al. 2017). Untaru et al. (2016), using the extended TRA, found that water conservation activities in everyday life have a significant positive relationship with intention to conserve water in a lodging context. Han and Hyun (2018) found a significant positive relationship between water conservation in everyday life and intention to conserve water in the hospitality industry. Consequently, it is hypothesised that:

Hypothesis 4: There is a significant positive relationship between water conservation activities in everyday life and hotel guests' water conservation intention.

Environmental Concern and Water Conservation Intention

Chen and Tung (2014) describe environmental concern as a general attitude toward environmental protection, and an important factor in how individuals change their behaviour to become more ecologically friendly. Many empirical studies have directly linked environmental concern to green purchase intention and behaviour. Wang et al. (2016) used the extended version of the TPB to examine consumers' intention to adopt hybrid vehicles in China. The study found that environmental concern was positively associated with the intention to purchase hybrid vehicles. Li et al. (2019) found that environmental concern had a direct significant positive relationship with intention to purchase energy efficient appliances in China. Bamberg (2013), however, points out that a meta-analysis of studies revealed that the direct relationship between environmental concern and specific environmentally related behaviour was weak, with the majority of empirical findings showing low to moderate relationship. This can be attributed to the incorrect assumption that general attitudes, like environmental concern, can directly predict specific behaviours (Bamberg 2013). Therefore, future research should not view environmental concern as a direct, but rather an indirect predictor of specific behaviour. Ajzen and Fishbein (1980) suggest that general attitude, like environmental concern, does not relate to a specific behaviour directly, but indirectly. In addition, an individual's attitude, subjective norm, and perceived behavioural control are affected by his/her general attitude through situation-specific behavioural, normative, and control beliefs. Chen and Tung (2014), in a study on consumer intention

to visit green hotels, found that attitude, subjective norms, perceived behavioural control and perceived moral obligation were affected by environmental concern. Untaru et al. (2016) tested the effect of environmental concern on the two TRA constructs and water conservation activities in everyday life. The results indicate that environmental concern significantly affects attitude and water conservation activities in everyday life, but has an insignificant effect on subjective norms. Zhang et al. (2019), in a study that extended the TPB to explain the effects of cognitive factors across different types of green products in China, found a significant positive relationship between environmental concern and the three TPB constructs. Maichum et al. (2016) found that environmental concern had a significant direct positive effect on the intention to purchase green products. In addition, environmental concern positively affects attitude towards purchasing green products and perceived behavioural control, but has an insignificant effect on subjective norms. Chen and Tung (2014) found that consumers' environmental concern positively influenced attitude toward visiting green hotels, subjective norms, perceived behavioural control, and perceived moral obligation. Untaru et al. (2016), in a study that used the TRA, examined the mediating effect of attitude, subjective norms and water conservation activities in everyday life in the relationship between environmental concern and water conservation intention. The findings indicate that among the three mediator variables, only attitude mediated the effect of environmental concern on water conservation intentions.

This current study added environmental concern to the TPB and considered both the direct and indirect effects. It is hypothesised that:

Hypothesis 5: Environmental concern is positively related to hotel guests' intention to conserve water.

Hypotheses 6-9: Environmental concern is positively related to attitude, subjective norms, perceived behavioural control and water conservation activities in everyday life.

Hypotheses 10-13: Attitude, subjective norms, perceived behavioural control and water conservation activities in everyday life mediate the relationship between environmental concern and water conservation intention.
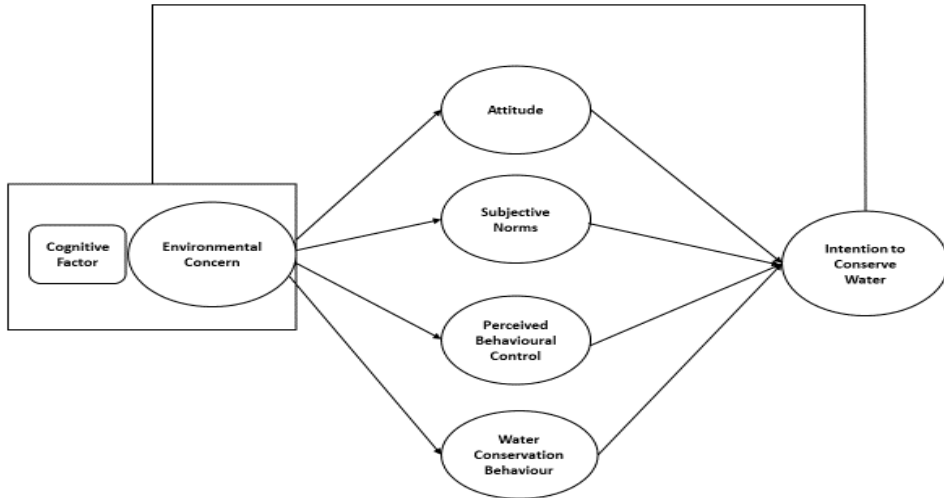

Figure 1: The conceptual framework

Source: Author's conceptualisation

Research Methodology

The study adopted a quantitative research approach. The cross-sectional survey method was used to collect data from the participants. The participants were guests that stayed in selected hotels, lodges and guest houses in Pretoria, Johannesburg and Polokwane. Pretoria and Johannesburg are located in the Gauteng province, while Polokwane is located in the Limpopo province. Pretoria is the administrative capital of South Africa and Johannesburg, the major economic hub, and many hospitality firms are located in the two cities. Polokwane is the capital of the Limpopo Province, with many hotels and visitors. The researcher conveniently sampled the participating hospitality firms from the websites of the Tourism Grading Council of South Africa (TGCSA) and Trivago. TGCSA helps guests to compare the standards of different hotels while Trivago assists guests to search for available hotels.

A pilot study was conducted with 30 hotel guests in Polokwane before the actual survey. The participants in the pilot study did not participate in the main survey. The questionnaire used for the survey was examined by two academics in the area of sustainability to ensure face and content validity. Before the distribution of questionnaires, the researcher contacted the managers/owners of 70 accommodation

establishments to solicit their participation. This was done through telephone calls and e-mails and 20 hotels agreed to participate in the survey. Fifty questionnaires were distributed in each participating hotel and to respect the privacy of hotel visitors, only willing hotels and visitors were selected for participation in the survey. In addition, the objectives of the study and its benefits to the hospitality industry were described in a covering letter. The participants in the survey were recruited at the hotels and additional questionnaires were left in the reception halls and dining rooms. These questionnaires were collected after completion with the assistance of hotel employees. The researcher ensured the confidentiality and anonymity of the hotels and guests that participated in the survey. Therefore, the names of the hotels and guests were not asked for. Appendix one depicts the full questionnaire, and ethical clearance was obtained from the author's university before data collection. The Partial Least Square Structural Equation Modelling (PLS SEM) was used for data analysis.

Results

Response Rate and Biographical Details

One-thousand questionnaires were distributed to respondents and 416 questionnaires were returned and found usable. Eighteen questionnaires were not usable because the respondents failed to complete significant questionnaire items. The "rule of 10" was used to determine the appropriate minimum sample size to test the model. According to Hair et al. (2011), when using PLS SEM to test a model, the minimum sample size should be 10 times the highest number of structural paths directed at the latent construct at a time. In this study, there were 23 question items (appendix one) and so a minimum of 230 respondents would be needed. However, 416 useable questionnaires were obtained. There were 231 male and 185 female respondents. The age distribution was as follows: 18–20 years, 17 respondents; 21–30, 62 respondents; 31–40, 145 respondents; 41–50, 136 respondents; 51–60, above 60. Altogether 348 respondents had post matric qualifications (diplomas and degrees) and 86 respondents had a matric qualification.

Descriptive Statistics

Table 1 depicts the results of the descriptive statistics. The results indicate that the standard deviations of all constructs are below one and within acceptable range The skewness and kurtosis values for all constructs range between +2 and -2.

Table 1: Descriptive statistics

Construct	Mean	SD	Skewness	Kurtosis
Attitude	4.05	0.86	0.77	0.11
Subjective norms	3.12	0.91	-0.72	1.08
Perceived behaviour control	3.97	0.77	0.64	0.53
Water conservation activities	3.66	0.82	0.73	0.72
Environmental concern	4.02	0.89	-0.81	0.25
Intention	3.55	0.79	0.69	0.69

Structural equation modelling

The Evaluation of the Measurement Model

The criteria highlighted by Hair et al. (2019) were used to evaluate the measurement model. These are factor loadings (>0.708), composite reliability (between 0.790 and 0.900), Cronbach's alpha (>0.700) and the Average Variance Extracted (AVE) (>0.500). In addition, the square roots of the AVEs should be greater than the correlations amongst variables. Tables 2 and 3 show that all the criteria were met.

Table 2: The measurement model

Construct	Measurement items	Item loading	Cronbach's alpha	Composite reliability	AVE
Attitudes (ATT)	ATT1	0.829	0.805	0.858	0.600
	ATT2	0.724			
	ATT3	0.817			
	ATT4	0.731			
Subjective norms (SN)	SN1	0.723	0.746	0.802	0.575
	SN2	0.749			
	SN3	0.802			
Perceived behavioural control	PBC1	0.890	0.811	0.850	0.655
	PBC2	0.801			
	PBC3	0.730			
Environmental concern (EC)	EC1	0.801	0.726	0.900	0.563
	EC2	0.728			
	EC3	0.761			
	EC4	0.779			
	EC5	0.722			
	EC6	0.731			
	EC7	0.727			
Water conservation activities (WCA)	WCA1	0.806	0.800	0.825	0.610
	WCA2	0.801			
	WCA3	0.736			
Intention (INT)	INT1	0.844	0.733	0.836	0.631
	INT2	0.803			
	INT3	0.732			

Table 3: Discriminant validity

Construct	INT	ATT	SN	PBC	EC	WCA
INT	**0.794**					
ATT	0.484	**0.758**				
SN	0.308	0.401	**0.758**			
PBC	0.529	0.613	0.524	**0.809**		
EC	0.530	0.622	0.526	0.518	**0. 750**	
WCA	0.526	0.613	0.403	0.529	0.402	**0.781**

Note: Diagonal values depict the square root of AVEs for the constructs.

Structural Model Assessment

In order to assess the structural model, the common method bias (CMB), the coefficient of determination (R^2), the predictive relevance of the model (Q^2), the goodness of fit (GOF), the effect size, the standardised root mean square residual (SRMR) and the evaluation of the path coefficients need to be examined (Hair et al. 2019). The values of the variance inflation factor (VIF) range from 1.209 to 2.620. This suggests that the model is free of CMB as the VIF values are below 3.3. The R^2 of the original TPB model accounted for 39.3% of the variance. The extended model explained 51.9% of the variance. When using PLS SEM, R^2 values of 0.26, 0.50 and 0.75 are considered weak, moderate and substantial respectively. The GOF of 0.561 shows that the empirical data were sufficiently captured by the model and the Q^2 of 0.61 suggests a highly predictive model. The effect size, f^2, ranged from 0.115 to 0.142 indicating that the effect sizes of different endogenous constructs on the exogenous construct were satisfactory. The standardised root mean square residual (SRMR) of 0.02 suggests a good model fit. Table 4 depicts the results of the path coefficients.

Table 4: Path coefficient and t-statistics

Hypothesised path	Standardised Beta	T-statistics	Decision
H1 ATT→INT	0.209	7.144*	Supported
H2 SN→INT	0.142	2.409**	Supported
H3 PBC→INT	0.191	4.085**	Supported
H4 WCA→INT	0.186	3.729*	Supported
H5 EC→INT	0.208	3.409**	Supported
H6 EC-ATT	0.185	2,592*	Supported
H7 EC-SN	0.042	0.083	Not supported
H8 EC-PBC	0.105	3.007**	Supported
H9 EC-WCA	0.201	3.283*	Supported

Note: *$P<0.01$; ** <0.05

Table 5: Mediation results

Mediation path	Indirect effect	Total effect and T-statistics	Confidence interval bias (corrected)	Decision	VAF
			LL UL		
H10 EC→ATT→INT	0.109**	0.135* (3.608)	0.444 0.208	Accepted (full mediation)	80.74%
H11 EC→SN→INT	0.064	0.392 (1.129)	0.064 0.308	Rejected No mediation)	16.32%
H12 EC→PBC→INT	0.112**	0.268** (1.110)	0.072 0.299	Accepted (partial mediation)	41.79%
H13 EC→WCA→INT	0.117*	0.518* (1.108)	0.061 0.179	Accepted (partial mediation)	22.58%

Note: *P<0.01; ** <0.05

The results as depicted in table 4, show that three TPB constructs have direct and significant positive relationships with water conservation intention. Therefore, hypotheses 1, 2 and 3 are accepted. In addition, the constructs used to extend the TPB (environment concern and water conservation activities) have significant positive relationships with water conservation intention. Hypotheses 4 and 5 are supported. The results also indicate that environmental concern has significant positive relationships with attitude, perceived behavioural control and water conservation activities. Hypotheses 6, 8 and 9 are supported. The effect of environmental concern on subjective norms is insignificant and hypothesis 7 is not supported. Table 5 depicts the results of mediation. The existence of full or partial mediation can be determined by the Variance Accounted For (VAR). If the VAR is less than 20%, mediation is close to zero, for a VAR value between 20% and 80% (partial mediation) and above 80% (full mediation) (Hair et al. 2019; Nitzl, Roldan, and Cepeda-Carrion 2016). The indirect paths between EC and ATT, PBC and WCA and intention are positive and significant. Thus, a complementary partial mediation is confirmed. The indirect path of EC and ATT and INT shows full complementary mediation. The indirect paths of EC and PBC, WCA and intention show partial complementary mediation. Thus, Hypotheses 10, 12 and 13 are supported. The indirect path between EC, SN and INT is insignificant. Hypothesis 11 is not supported.

Discussion

The study which directed this article examined the predictors of hotel guests' intention to conserve water. This study had three objectives: 1) to investigate how the three constructs of the TPB model will affect hotel guests' intention to conserve water; 2) to examine the effect of the extended TPB model that includes environmental concern and environmentally friendly behaviours in everyday life on hotel guests' intention to conserve water; and 3) to investigate if the three TPB constructs and environmentally friendly behaviours in everyday life will mediate the relationship between environmental concern and intention to conserve water.

The findings of the study support the applicability of the TPB model in predicting hotel guests' intention to conserve water. The three TPB constructs have significant positive relationships with intention to conserve water. The results indicate that individuals with a positive attitude towards water conservation are likely to conserve water when staying in hotels. In addition, the opinions of people that are important to the guest can influence water conservation. Also, the availability of knowledge about water conservation can positively affect water conservation behaviour. The findings of this study are supported by the results of prior empirical studies. Untaru et al. (2016) used the TRA to investigate the intention of guests to conserve water when staying in a lodging establishment. The results indicate that attitude towards water conservation behaviour and subjective norms are positively associated with guests' intention to conserve water. Maichum et al. (2016)

found that attitude, subjective norms and perceived behavioural control were positively associated with the purchase intention of green products.

Two constructs (environmental concern and water conservation activities in everyday life) were used to extend the TPB. The results indicate significant positive relationships between the two constructs and intention to conserve water. The results are consistent with the findings of previous empirical studies. Untaru et al. (2016) found that environmental concern and water conservation activities in everyday life had significant positive relationships with intention to conserve water in a lodging context. The findings of the study by Han and Hyun (2018) show significant positive relationships between environmental concern and water conservation activities in everyday life, and intention to conserve water in the hospitality industry. The study also examined the indirect effect of EC in line with the suggestions of Bamberg (2013). The results indicate that attitude fully mediates the relationship between environmental concern and intention, while the effects of perceived behavioural control and water conservation activities in everyday life show partial mediation. The results are consistent with the findings of similar empirical studies. Maichum et al. (2016) found that that environmental concern positively affected attitude towards purchasing green products and perceived behavioural control, but had an insignificant effect on subjective norms. Chen and Tung (2014) found that consumers' environmental concern positively affected attitude toward visiting green hotels, subjective norms, perceived behavioural control and perceived moral obligation. Untaru et al. (2016) found that attitude mediated the effect of environmental concern on water conservation intentions.

Conclusion

The study examined, by applying the TPB, the predictors of hotel guests' intention to conserve water. The study also investigated the effect of the extended TPB model that included environmental concern and water conservation activities in everyday life. The findings indicate that the TPB and the extended model are applicable in predicting water conservation intention. Theoretically, the study developed and tested a unique model for the predictors of water conservation intention by hotel guests. Empirically, the study adds to the literature on factors that can help to improve water conservation, especially in South Africa.

The study has some managerial implications. To improve attitude towards water conservation, perceived behavioural control and environmental concern of guests, hotel management should develop water conservation messages. For instance, putting cards and notices that contain water conservation information in the rooms, bathrooms and strategic locations and on their websites. This kind of messaging will show that water conservation is good behaviour that can help to prevent the exhaustion of resources and save the planet. This will help to create awareness about environmental protection and shift the behaviour of guests towards sustainable consumption. To improve subjective norms, previous guests that have stayed in hotels should be used in marketing campaigns on various media platforms to share the benefits of water conservation and encourage

potential visitors to conserve water. To improve water conservation activities at home, which can affect the water conservation behaviour of hotel guests, governments, non-governmental organisations and media should continue to emphasise the need to conserve water at home and work in order to protect the environment for today and future generations.

The study has the following limitations and areas for further study. The study focused on the predictors of intention and not actual behaviour. Intention does not always predict behaviour and other studies can investigate the predictors of water conservation behaviour of hotel guests. The explanatory power of the TPB, in the context of water conservation intention, can also be further improved through the inclusion of other personal variables such as anticipated guilt, pride and moral norms. The moderating effects of socio-demographic variables (level of income, age, gender, level of education) and the influence of stay characteristics variables (length of stay and loyalty) can also be examined.

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Appendix One: Questionnaire			
Construct	**Items**	**Response category**	**Source**
Attitude towards water conservation	• ATT1. For me, conserving water when staying as a guest lodging establishment is positive • ATT2. For me, conserving water when staying as a guest lodging establishment is good • ATT3. For me, conserving water when staying as a guest lodging establishment is wise • ATT4: For me, conserving water when staying as a guest lodging establishment is desirable	1 strongly disagree, 5 strongly agree	Ajzen (1991); Han et al. (2010); Untaru et. al (2016
Subjective norms (SN)	• SN1. People whose opinions I value would prefer me to conserve water when staying in a lodging establishment • SN2. Most people who are important to me think I should conserve water when staying in a lodging establishment • SN3. Most people who are important to me would want me to conserve water when staying in a lodging establishment	1 strongly disagree, 5 strongly agree	Ajzen (1991); Han et al. (2010); Untaru et. al (2016)
Perceived behavioural control (PBC)	• PBC1. Whether or not I conserve water when staying in a lodging establishment, is completely up to me • PBC2. I am confident that if I want, I can conserve water when staying in a lodging establishment • PBC3. I have resources, time, and opportunities and knowledge to conserve water when staying in a lodging establishment	1 strongly disagree, 5 strongly agree	Han et al. (2010); Budovska et al. (2019)
Intention to engage in water conservation when staying in a lodging establishment.	• INT1.I am willing to conserve water when staying in a lodging establishment • INT2. I plan to conserve water when staying in a lodging establishment • INT3. I will make an effort to conserve water when staying in a lodging establishment	1 strongly disagree, 5 strongly agree	Ajzen (1991); Han et al. (2010); Untaru et. al (2016)

Appendix One: Questionnaire			
Construct	**Items**	**Response category**	**Source**
Environmental concern	• ECI am extremely worried about the state of the world's environment and what it means for the future • EC2Mankind is severely abusing the environment • EC3When mankind interferes with nature, it often produces disastrous consequences • EC4The balance of nature is delicate and easily upset • EC5Human must live in harmony with nature in order to survive • EC6I think that environmental problems are important • EC7I think that we should care about environmental problems	1 strongly disagree, 5 strongly agree	Chen and Tung (2014); Yadav and Pathak (2015)
Water conservation activities in everyday life (WCA	• WCA1. At home, I turn off the shower water when I am soaping • WCA2. At home, I turn off the tap water when I am soaping • WCA3. At home, I turn off the tap water when I am brushing my teeth	1 strongly disagree, 5 strongly agree	Untaru et. al (2016); Han and Hyun (2018)