

**This is a pre-publication version of the article, accepted for publication in *International Journal of Contemporary Hospitality Management*. Please cite appropriately as follows:**

**Nunkoo R., Teeroovengadum, V., Thomas, P., & Leonard, L. (2017). Integrating Service Quality as a Second-Order Factor in a Customer Satisfaction and Loyalty Model. *International Journal of Contemporary Hospitality Management*, 29(12), 2978-3005.**

### Integrating Service Quality as a Second-Order Factor in a Customer Satisfaction and Loyalty Model

**Purpose:** The study conceptualizes service quality as a second-order factor and analyzes its influence on customer satisfaction, perceived value, image, consumption emotions, and customer loyalty by testing a structural equation model.

**Design/Methodology:** The model is tested using data collected from 672 guests staying in accommodation establishments located in South Africa. The study follows a hierarchical approach using confirmatory factor analysis to test the second-order factor model and structural equation modeling to test the overall model.

**Findings:** The results indicate that the second-order factor model is acceptable both empirically as well as conceptually and performs better than other competing models of service quality. Findings provide support for all hypotheses and evidence of a structural model with a high explanatory power.

**Research Limitations:** The second-order factor model is less useful when fine-grained analyses are needed, such as when a detailed assessment of the level of quality of service offered by a hospitality organization is required.

**Practical Implications:** The second-order service quality model allows for analysis at different levels of abstraction. Accommodation managers interested in customers' evaluation of service on a cumulative basis can make use of the global measure to determine service quality evaluations. Practitioners can also use the findings to manage the different dimensions of service quality.

**Originality:** The study demonstrates that service quality is best represented as a second-order factor, and in doing so, it provides an improved measurement of the construct. More so, by integrating the variable in a nomological network, the research develops a more parsimonious model than existing ones.

**Keywords:** service quality; second-order factor; customer satisfaction; image; confirmatory factor analysis; customer loyalty.

## **1. Introduction**

With ever growing competition, market share and financial success of hospitality businesses depend largely on the level of service quality (Chen, 2013; Ren et al., 2016; Sari et al., 2016). A high level of service allows hospitality organizations to retain customers and maintain a competitive advantage in the market. Parasuraman et al. (1988) defined service quality as the difference between customer expectations of the service to be received and the actual performance of the service. Researchers have used models such as SERVQUAL (Parasuraman et al., 1988), HOLSERV (Wong et al., 1999), and LODGSERV (Knutson et al., 1990) to measure service quality in the hospitality industry and have come-up with different sub-dimensions of the construct. While there is considerable debate on the dimensions of service quality (Wilkins et al., 2007), there is no disagreement on the fact that it is a multidimensional construct irrespective of the organizational setting under study (Brady and Cronin, 2001).

An approach particularly useful when dealing with multidimensional constructs is the second-order factor model (Chen et al., 2005). In a second-order factor model, the first-order factors are sub-dimensions of a broader and more encompassing second-order factor (Hair et al., 2006). Such a model represents the hypothesis that the seemingly distinct, but related sub-dimensions can be accounted for by an underlying higher-order construct such as service quality. A second-order factor model has several advantages. First, it tests whether the hypothesized higher-order factor accounts for the patterns of relation between the first-order factors. Second, it puts a structure on the pattern of covariance between the different first-order constructs and in so doing, it explains the covariance in a more parsimonious way with few parameters. Third, a second-order factor provides a theoretically error-free estimate of the specific factors, as it allows the separation of variance due to specific factors from measurement errors (Chen et al., 2005; Rindskopf and Rose, 1988). Measurement errors

artificially inflate or deflate path coefficient values, compromising an entire model (Mackenzie, 2001). Finally, a second-order factor meaningfully reduces the number of variables that need to be estimated in a structural model without losing measurement accuracy (Koufteros et al., 2009). Thus, a second-order factor model provides a more parsimonious and interpretable model than a first-order factor model and therefore, has considerable potential for advancing research on a multidimensional construct like service quality.

While the benefits of incorporating service quality as a second-order factor in a structural model have been proven empirically in other fields (e.g. Bauer et al., 2006; Blut, 2016; Koufteros et al., 2009), hospitality research has yet to exploit the full potential of this technique. Two main limitations can be identified from existing studies. First, while some few hospitality researchers have rightly conceptualized service quality as a second-order factor, they did not consider the construct with other variables in a structural model (e.g. Wilkins et al. 2007). Such an approach is of limited value as Chin (1998) argued:

To postulate the existence of a second order factor that sits in a vacuum holds little value. Rather, it must be related to other factors in a conceptual model. Because a second order factor is modeled as being at a higher level of abstraction and reflected by first order factors, it needs to be related with other factors... Therefore, it is imperative that this be demonstrated by embedding such second order factor models within a nomological network (i.e., used as a consequent and/or predictor of other LVs) (p. x).

Second, although some researchers have incorporated service quality as a predictor or dependent variable in a structural model, they unfortunately, created a composite measure of the construct using a number of indicators as if service quality is unidimensional (e.g. Deng et al., 2013; Oh, 1999; Su et al., 2016; Žabkar et al., 2010). These studies omit the empirically proven notion that service quality is multifaceted and as such, they are inconsistent with the conceptual specification of higher-order modeling of abstraction inherent to the service quality concept. Such studies therefore do not benefit from the

advantages a second-order factor model offers, but as well, a one-dimensional approach to conceptualizing service quality, curtails explanatory power and theoretical usefulness of the structural model (Gerbing et al., 1994; Koufteros et al., 2009).

This paper addresses the limitations described above by integrating service quality as a second-order factor in a customer satisfaction and loyalty model (Figure 1). The second-order service quality factor employed in this study embodies the meaning of ten first-order latent variables representing the different sub-dimensions of service quality in an accommodation setting. Our model which builds on existing ones (e.g. Deng et al., 2013; Oh, 1999; Su et al., 2016; Žabkar et al., 2010), proposes that customer satisfaction is influenced by service quality, image, perceived value, and consumption emotions. The model also tests whether customer satisfaction, image, and perceived value predict customer loyalty. Even though the path relationships proposed in the model have been tested in some previous studies, we provide here a truer reflection of the influence of service quality on the different outcome variables given the methodological benefits of the second-order factor approach. In so doing, we provide a better representation of consumer psychology via a more robust structural model. The paper is not claiming that the use of a second-order factor model is appropriate in all circumstances. Rather, we argue that when embedded in a nomological network which previous studies have failed to do, a second-order service quality model leads to a theoretically robust and more parsimonious structural model (Koufteros et al., 2009). We used data collected from travelers to South Africa to test the model.

INSERT FIGURE 1 HERE

## **2. Service quality as a Second-Order Factor**

Service quality is described as an abstract concept as it is not possible to measure it objectively as is the case for physical goods (Zeithaml et al., 1990). The specificities of the

hospitality services such as the absence of predefined standards, need for consistency and high level of interaction, and exchange of information add to the complexity of conceptualizing and measuring service quality (Akbaba, 2006). Nevertheless, it is an important construct that attracts the attention of researchers as well as practitioners (Dedeoğlu and Demirer, 2015; Rauch et al., 2015). Following a comprehensive review of past models of service quality for hospitality services, Wu (2009) developed a holistic framework for service quality which forms the basis of the first-order factors proposed in the present research. Accommodation infrastructure emerged as an important sub-dimension of service quality in Wu's (2009) study. This dimension usually includes the overall physical environment of the service provider, such as décor, design, cleanliness, and ambience of the accommodation. Some other studies also suggest that these different aspects of accommodation infrastructure are important to service quality in the hotels (e.g. Lockyer, 2002; Wu and Weber, 2005).

Room quality has been found to be another important contributor to overall service quality of hotels (Choi and Chu, 2001; Min and Min, 1997). Room quality takes into account the specifics of the core product of accommodation services which is the hotel room. Room quality includes such elements as the size of the room, the adequacy of the hotel's bed, comfort of mattress and pillow, and cleanliness. Front desk quality which includes such aspects as check-in procedures, luggage transfer process, and payment procedures are other essential service attributes for the accommodation service providers (Chu and Choi, 2000; Getty and Getty, 2003). The quality of food and beverage has also been identified as a context-specific service quality dimension relevant to the accommodation segment (Giritlioglu et al., 2014). For example, Akbaba (2006) found that service attributes related to food and beverages were rated by guests as being among the most important sub-dimensions

of service quality. A similar conclusion can be derived from the study by Chu and Choi (2000).

Another dimension of service quality is safety and security (Wu, 2009). In general, safety considerations involved protecting people, but security factors also embraced protecting the hotel property and customers' possessions, in addition to ensuring employees' and customers' individual safety (Enz and Taylor, 2002). Safety and security have become a pivotal concern among travelers throughout the world and is therefore an important aspect of a hotel's service quality. Existing literature also suggests the attitudes and behaviors employees are important components of service quality in hotels (Bitner et al. 1990; Crosby et al., 1990; Parasuraman et al. 1988; Wu, 2009). Employee attitude and behaviors are considered traits characteristic which include the degree of sociability, tenderness, graciousness, demeanor, distress, honesty, and care employees display toward hotel guests (Czepiel et al., 1985). Some other studies suggest that service quality is largely determined by the perception of expertise (Brady and Cronin, 2001; Ko and Pastore, 2005). Expertise has been described as the extent to which the customer-employee interaction is influenced by the skills and knowledge of employees in accomplishing specific tasks (Czepiel et al., 1985). Expertise is informed by employees' training, their knowledge of the products, their capabilities to offer a good service, their competence in delivering the service, and their problem solving skills (Caro and García, 2008; Kim and Cha, 2002).

Customer interaction is another important dimension of service quality (Lehtinen and Lehtinen, 1991). Customer interaction is the face-to-face or technology mediated interaction that occurs between two or more customers inside or outside a service setting (Ramaswamy 2008). Various studies support the view that customer interaction is a determinant of customers' service quality evaluation (e.g. Brady and Cronin, 2001; Ko and Pastore, 2005).

Another accommodation service quality dimension is sociability. Sociability has been conceptualized as the positive social experiences that customers gained from the sense fulfillment of being with other people who also participated in the same activity together and shared their enjoyment (Milne and McDonald, 1999). Baldacchino (1995) advocated that family members, friends and other acquaintances could be viewed as significant social factors influencing service quality. Waiting time is another service quality dimension identified in previous studies. Waiting time is the amount of time customers need to wait for a service (Hornik, 1982). When customers enter a service system, they have, to some extent, expectations regarding an acceptable waiting time (Taylor, 1994). Several researchers suggest that longer waiting periods result in customers' negative perceptions of service quality (Houston et al., 1998; Taylor, 1994).

There is enough theoretical and empirical evidence suggesting that service quality can be treated as a second-order factor. Wilkins et al. (2007) found support that service quality in first class and luxury hotels can be considered meaningfully as a second-order construct, comprising of physical product, service experience, and quality of food and beverage as its first-order factors. Narayan et al. (2008) developed two second-order factor models of service quality (SQ1 and SQ2) and investigated their relationships with customer satisfaction and loyalty. SQ1 comprised of five first-order factors namely hospitality, food, logistic, value for money, and security while SQ 2 comprised of nine first-order factors namely amenities, culture, hygiene, fairness of price, core-tourism experience, information centers, personal information, irritants, and pubs. The researchers found empirical support for both second-order models of service quality and noted their distinct influence on customer satisfaction and loyalty.

Similar evidences exist outside the hospitality literature. For example, in their study across eight industries, Brady and Cronin (2001) conceptualized service quality as a higher-order construct comprising of nine first-order factors namely attitude, behavior expertise, ambient conditions, design, social factors, waiting time, tangibles, and valence. Likewise, Bauer et al. (2006) validated service quality as a second-order construct comprising of functionality/design, enjoyment, process, reliability, and responsiveness as the first-order factors in their study on online shopping. In a retail context, Dabholkar et al. (1995) successfully validated the service quality construct as comprising of six first-order factors namely appearance, convenience, promises, doing it right, inspiring confidence, and courteous/helpful. Kang and James (2004) modeled and found empirical support for functional service quality as a second-order construct, where reliability, assurance, tangible, empathy, and responsiveness were proposed as the first-order factors. These various studies suggest that service quality is multidimensional, comprising of context-specific dimensions which are strongly correlated, suggesting that it is best to consider the construct as a second-order factor. As Koufteros et al. (2009) argue in their research on airline service quality:

The facets posited as first-order constructs, are treated as reflective indicators of the second-order factor and are thus expected to be highly correlated. It is in fact on the basis of what they share that we put them together under the umbrella of a second-order construct. They share the more abstract construct, the second-order factor (p. 645).

Based on the preceding theoretical and empirical evidence, we propose the following hypothesis:

*Hypothesis 1: The ten distinct, but related sub-dimensions of service quality can be accounted for by a common underlying higher order service quality factor model which is significantly better than a first-order service quality factor model.*

### *2.1 Customer Satisfaction*

Service quality has been found to be a major predictor of customer satisfaction in several studies (Oh and Kim, 2017; Pizam et al., in press). Among the seminal studies suggesting



such a relationship are that of Parasuraman et al. (1988) and Rust and Oliver (1994). A similar conclusion has been reached in the hospitality context, where service quality was established as a major antecedent of customer satisfaction (Deng et al., 2013; Oh, 1999; Shi et al., 2014; Su et al., 2016). Indeed, in a recent meta-analysis research, Ladeira et al. (2016) found service quality to be an important antecedent of customer satisfaction in various tourism and hospitality contexts. Based on the preceding empirical evidence, we propose the following hypothesis:

*Hypothesis 2: Service quality positively influences customer satisfaction.*

## *2.2 Consumption emotions*

Consumption emotions are the subjective feeling states consumers experience when purchasing or using a product or a service. Dubé and Menon (2000) defined consumption emotions as “the affective responses to one’s perceptions of the series of attributes that compose a product or service performance” (p. 288). Scholars use the term consumption emotion as it is related to the positive or negative emotions felt as a result of products or services consumed (Richins, 1997). Emotions differ in various contexts and are usually broad (Hosany and Gilbert, 2010). While some studies carried out in various hospitality contexts suggest that consumption emotions is significantly related to service quality (e.g. Deng et al., 2013), others have found the variable to be a good predictor of customer satisfaction (Ali et al., 2016a, 2016b; Deng et al., 2013; Han and Back, 2007; Jung and Yoon, 2011). Based on the preceding discussion, we propose the following hypotheses:

*Hypothesis 3: Service quality positively influences consumption emotions.*

*Hypothesis 4: Consumption emotions positively influence customer satisfaction.*

### 2.3 *Perceived value*

Perceived value is defined as the “customer’s overall assessment of the utility of a product based on perceptions of what is received and what is given” (Zeithaml, 1988, p.14).

Following this definition, we conceptualize perceived value as the assessment of the perceived benefits of accommodation services by customers based on the difference between what they give in terms of time, effort, and money and what they perceive to receive in terms of the performance of the services provided to them. Perceived value is one of the most important factors influencing an organization’s competitiveness (Ravald and Gronroos, 1996; Parasuraman, 1997). It is therefore not surprising to note that a number of studies reveal a positive relationship between perceived value and customer satisfaction across various service contexts, including in hospitality environments (e.g. Bajs, 2015; Deng et al., 2013; Joung et al., 2016; Oh, 1999; Ryu et al., 2008, 2012). Empirical evidence also suggests that perceived value of hospitality products is influenced by such variables as service quality (Deng et al., 2013; Yoon et al., 2010) and consumption emotions (e.g. Hyun et al., 2011; Deng et al., 2013). Based on the preceding empirical evidence, the following hypotheses are proposed:

*Hypothesis 5: Perceived value positively influences customer satisfaction.*

*Hypothesis 6: Service quality positively influences perceived value.*

*Hypothesis 7: Consumption emotions positively influence perceived value.*

### 2.4 *Image*

Image is defined as “the total impression an entity makes on the minds of people” (Dowling, 1993, p. 104). This variable has been found to have an important influence on consumer attitudes and behaviors (Ramkissoon et al., 2010). In a critical review of the ACSI model, Johnson et al. (2001) noted that image is an important construct that was not considered by the model and recommended that it is including in customer satisfaction

studies. The relationship between image and customer satisfaction has been validated in various service contexts (Bloemer and De Ruyter, 1998; Cretu and Brodie, 2007). A similar conclusion can be drawn from research carried out various in hospitality environments (e.g. Chi and Qu, 2008; Kandampully and Suhartanto, 2000; Ryu et al., 2008). There is also empirical evidence to support the notion that better image perception leads to better perceived value for a product or service. Although an empirical study by Andreassen and Lindestad (1998) found no effect of image on perceived value, subsequent empirical studies including those relating to hospitality services established a significant relationship between the two variables (Cretu and Brodie, 2007; Ryu et al., 2008). Another group of research which considered image as an outcome variable indicated that it is conditioned by the level of service quality offered by hospitality organizations (e.g. Hu et al., 2009; Ryu et al., 2012; Tosun et al., 2015)

*Hypothesis 8: Image positively influences customer satisfaction.*

*Hypothesis 9: Image positively influences perceived value.*

*Hypothesis 10: Service quality positively influences image.*

## 2.5 Customer loyalty

Loyalty is defined as “a deeply held commitment to rebuy or patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior (Oliver, 1997, p. 392). Ensuring customer loyalty is an important goal of any organization (García de Leaniz et al., 2015; Kandampully et al., 2015). Loyalty behaviors include repeat purchases, positive word-of-mouth, and the propensity to pay more (Su et al., 2016). In the hospitality and related literature, loyalty has been found to be influenced by customer satisfaction (Chang, 2013; Deng et al., 2013; Gregory et al., 2016; Liu and Jang, 2009; Su et al., 2016), perceived value of the products or service (Chen and Chen 2010; Gregory et al., 2016; Oh, 1999; Suh and Ahn, 2012) and image

(Kandampully and Suharto, 2000, 2003; Park and Nunkoo, 2013; Ryu et al., 2008). Based on the preceding discussion, we propose the following hypotheses:

*Hypothesis 11: Customer satisfaction positively influences customer loyalty.*

*Hypothesis 12: Perceived value positive influences customer loyalty.*

*Hypothesis 13: Image positively influences customer loyalty.*

### **3 Research Methodology**

#### *3.1 Measurement of constructs*

The scales to measure the constructs were developed following an in-depth review of existing literature. The scales to measure the first-order factors of service quality are presented in Table 2 and were borrowed from various studies (e.g. Caro and García, 2008; Choi and Chu, 2001; Ekinici and Riley 2001; Knutson et al., 1990; Ko and Pastore, 2005; Lockyer, 2003; Wong et al., 1999; Wu, 2009). These items were measured on a 1-5 Likert scale where 1 represented “strongly disagree” and 5 represented “strongly agree”. Higher mean values on these scales would indicate better service quality. Items to measure consumption emotions, customer satisfaction, and image were measured on a scale where 1 = “strongly disagree” and 5 = “strongly agree”. Perceived value was measured on a scale where 1 represented “very poor” and 5 represented “excellent”. Loyalty was measured using four-item scale where 1 represented “very unlikely” and 5 represented “very likely”. These items were borrowed from Deng et al. (2013), Ryu et al. (2012) and Park et al. (2004). The scales are presented in Table 5.

#### *3.2 Data collection*

Data were collected from guests staying in different accommodation establishments in four provinces of South Africa: Western Cape, Kwazulu-Natal, Mpumalanga, and Gauteng. These provinces were chosen because in addition to being the most important ones in terms

of tourism development, they host more than 65% of the hotel establishments registered by the Tourism Grading Council of South Africa. The survey was carried out in the months of September and October 2015 by a team of trained final-year students, under the supervision of a senior professor assigned to each province. In line with previous studies (e.g. Deng et al., 2013), respondents were surveyed through an on-site intercept method. A total of 690 questionnaires were filled.

## **4 Results**

### *4.1 Preliminary statistical tests*

As a preliminary step, we assessed whether missing responses were a threat to the dataset using the following steps recommended by Hair et al. (2006): (1) determine the type of missing data; (2) determine the extent of missing data; (3) diagnosing the randomness of the missing data; and (4) selecting an imputation method. The analysis indicated that eighteen responses contained more than 10% missing values and were therefore excluded from further analysis (Hair et al., 2006), resulting in a usable sample of 672 cases. The randomness of the missing data was tested using Little's Missing Completely at Random (MCAR) test (Little, 1988). The test resulted in a non-significant chi-square value ( $\chi^2 = 2.279$ ,  $p > 0.05$ ) which suggested that the missing data in this study did not follow any particular pattern, and were therefore not problematic. Finally, given the relatively low level of missing responses remaining in the data set, we made use of the mean substitution method for imputation of missing data as recommended by Hair et al. (2006). Additionally, we tested the normality of the data by verifying the kurtosis and skewness values generated from the confirmatory factor analysis in the AMOS package (Version 21) which was used to run the statistical techniques. While skewness affects analysis of means, kurtosis severely influences tests of variances and covariances which underlie structural equation modeling. Therefore, the kurtosis values were examined. Results suggested that no values were greater than a rescaled value of 7,

satisfying the conditions for normality and thereby, the assumption underlying maximum likelihood estimation of structural equation modeling (West et al., 1995).

#### *4.2 Sample Profile*

Table 1 presents the profile of the survey respondents. The majority of them were male ( $n = 364$ , 54.2%). The average age of the respondents was 39.9 years old ( $SD = 13.28$ ). Most of the respondents were married ( $n = 366$ , 54.5%), followed by those who were single ( $n = 248$ , 36.9%), divorced/separated ( $n = 35$ , 5.2%), while the remaining were widowed ( $n = 23$ , 3.4%). The majority of them ( $n = 371$ , 55.3%) reported to have attained university level education. The sample was dominated by South Africans ( $n = 376$ , 56.4%), followed by Europeans ( $n = 109$ , 16.3%), other Africans ( $n = 81$ , 12.1%), Americans ( $n = 55$ , 8.2%), and Asians ( $n = 46$ , 6.9%). Concerning the type of accommodation, the majority of respondents stayed in non-park accommodation ( $n = 472$ , 70.3%) while the remaining stayed in park accommodation ( $n = 199$ , 29.7%). The mean level of stay of the respondents was 7.6 days ( $SD = 14.84$ ). In terms of purpose of visit, respondents visited South Africa mainly for holidays ( $n = 289$ , 43.1%) and business ( $n = 243$ , 36.2%). Respondents had an average number of previous visit of 1.88 times ( $SD = 5.31$ ).

INSERT TABLE 1 ABOUT HERE

#### *4.3 Psychometric properties of the first-order factors*

We applied a confirmatory approach to data analysis using the maximum likelihood method of estimation. Before assessing the structural model, the psychometric properties of the measurement scales of the first-order factors of service quality were estimated. The model displayed good fit indices (CFI = .95; TLI = .94; RMSEA = .05; SRMR = .05;  $\chi^2/df = 2.64$ ) and was tested further for its reliability and validity. Results are presented in Table 2. Reliability was assessed by analyzing the composite reliability and average variance

extracted (AVE) values which should be greater than .70 and .50 respectively (Hair et al., 2006; Nunkoo & Ramkissoon, 2012; Nunkoo et al., 2013). As indicated in Table 2, these conditions were met, evidencing reliability. AVE values greater than .50 and statistically significant factor loadings also evidenced convergent validity (Hair et al., 2006). However, the model did not achieve discriminant validity. This was to be expected because in a second-order factor model, one cannot demonstrate discriminant and convergent validity at the same time because of the highly correlated factors (Marsh and Hocevar, 1985; Koufteros et al., 2009). For such a model, convergent validity takes precedence (Koufteros et al., 2009). However, it is on the very basis of highly correlated factors, that service quality should be potentially considered as a second-order factor, where the first-order factors act as indicators of the second-order construct (Hair et al., 2006; Koufteros et al., 2009). This possibility was examined further as discussed below.

INSERT TABLE 2 ABOUT HERE

#### *4.4 Model comparison*

Now that the reliability and validity of the measures of the first-order factors have been established, we tested the performance of the second-order factor model of service quality. As per the recommended procedures for testing second-order factor models (see Rindskopf and Rose, 1988), we followed a hierarchical approach by developing four models (see Figure 2a-2d). M1 (Figure 2a) was the single first-order factor model with all the indicators loading on service quality. M2 (Figure 2b) hypothesized that the ten dimensions of service quality are separate and uncorrelated. In M3 (Figure 2c), it was hypothesized that the ten dimensions of service quality are correlated, but that no second-order factor exists. M4 (Figure 2d) was the second-order factor model of service quality. We used confirmatory factor analysis (CFA) to test and compare these models. Results are presented in Table 3. M1 and M2 had

unacceptable model fit indices. M3 had slightly better fit indices (CFI = .95; TLI = .94; RMSEA = .05; SRMR = .05;  $\chi^2/df = 2.64$ ) than M4 (CFI = .95; TLI = .95; RMSEA = 0.05; SRMR = .57;  $\chi^2/df = 2.84$ ), although the latter was also acceptable.

INSERT FIGURE 2a-2d HERE

According to Marsh and Hocevar (1985), a model that hypothesizes a second-order factor (e.g. M4) can never produce a better fit than a model that proposes correlated first-order factors (e.g. M3). However, it is better to consider the second-order factor model if it has an acceptable fit because a rival better-fitted first-order correlated factor model is likely to be characterized by problems of discriminant validity as we explained earlier (Marsh and Hocevar, 1985; Koufteros et al., 2009). More so, selecting the best model from equivalent models should also be based on theoretical grounds (Koufteros et al., 2009). Given the need for a second-order service quality model from a conceptual point of view and the empirical evidence supporting this assertion (e.g. Koufteros et al., 2009; Wilkins et al., 2007), we retained M4 as the most appropriate model and examined its performance in the overall measurement and structural model.

INSERT TABLE 3

#### *4.5 Testing the overall measurement and structural models*

Given the desirable results of the second-order service quality model, the overall measurement model was tested using CFA. As presented in Table 4, the fit indices of the model were within the recommended range (CFI = .94; TLI = .94; RMSEA = .04; SRMR = .05;  $\chi^2/df = 2.37$ ). The overall measurement model, which included the second-order factor model of service quality, was further tested for its reliability and validity. Reliability was assessed by analyzing the composite reliability and average variance extracted (AVE) values



which should be greater than .70 and .50 respectively (Hair et al., 2006). As shown in Table 5, all values exceeded the minimum threshold, evidencing reliability. AVE values greater than .50 as well as significant factor loadings between the items and their respective latent variable also evidence convergent validity (Hair et al., 2006). Results from Table 5 suggest that the overall measurement model, including the second-order factor model achieved convergent validity.

INSERT TABLE 4 and 5 HERE

Following Anderson and Gerbing (1988), we assessed discriminant validity by comparing all pairs of constructs in two-factor CFA models, where each model was estimated twice, with one constraining the correlation between the constructs to be one and the other allowing free estimation of the parameter. A model achieves discriminant validity if a significantly lower chi-square value is obtained for the model in which the correlation is not constrained to unity (Bagozzi and Phillips, 1982). As presented in Table 6, this condition was met, evidencing that the overall measurement model achieved discriminant validity.

INSERT TABLE 6 HERE

Once the reliability and validity of the measurement model was established, the structural model was tested (Figure 2). The fit indices were within acceptable range (Table 4: CFI = .94; TLI = .94; RMSEA = .04; SRMR = .51;  $\chi^2/df = 2.44$ ). Results of the path relationships are shown in Figure 3. As noted from the figure, all path relationships were statistically significant.

INSERT FIGURE 3 HERE

## 5 Discussion

Existing literature indicates that service quality is a multidimensional construct. Accordingly, we hypothesized that the ten distinct, but related sub-dimensions of service quality can be accounted for by a common underlying higher-order service quality factor model which is significantly better than a first-order service quality factor model. To verify this hypothesis, we followed a hierarchical approach to test second-order factor models using CFA. Basing ourselves on the empirical results from the modeling process as well as on theoretical grounds, we argued that it was reasonable to accept the second-order service quality model as a better model, allowing us to accept hypothesis 1. From a theoretical standpoint, the results suggest that service quality in an accommodation setting can be conceptualized meaningfully at a higher order of abstraction (Brady and Cronin, 2001; Kang and James, 2004; Wilkins et al., 2007). We thus argue that accommodation guests evaluate accommodation service quality on ten dimensions, but that they also view the overall service quality as a higher-order factor that captures a meaning common to all dimensions.

It is imperative for researchers to pay attention to the explanatory power ( $R^2$  values) of a structural model (Hair et al. 2012). Generally,  $R^2$  values of 0.75, 0.50, or 0.25 for the endogenous constructs are considered high, moderate, and weak respectively (Hair et al., 2012). The treatment of service quality as a higher-order construct and the inclusion of other relevant variables in the structural model allowed us to explain 84%, 52%, 65%, 63% and 84% of variance in customer satisfaction, consumption emotions, perceived value, image, and customer loyalty respectively. These values are comparatively higher to what have been reported in some studies and provide evidence of nomological validity of the second-order factor model of service quality. For example, Deng et al.'s (2013) model captured 61% and 62% of variance in customer satisfaction and loyalty respectively while Oh (1999) explained 49%, 35%, and 62% of variance in perceived value, customer satisfaction, and loyalty

respectively. While methodological and contextual issues may explain the differences in the variance captured, we argue that the second-order factor approach allowed us to explain considerably higher level of variances as such a model is characterized by more parsimony and high explanatory power (Chin, 1998; Koufterous et al., 2009).

Hypothesis 2 proposing a positive relationship between service quality and customer satisfaction was accepted ( $\beta = .34$ ;  $p < 0.001$ ), indicating that better perceptions of service quality leads to higher satisfaction among guests. Our study corroborates the findings of existing research (e.g. Chen and Chen, 2010; Deng et al., 2013; Oh, 1999). We also found support for hypothesis 3 which postulated a positive relationship between service quality and consumption emotions ( $\beta = .72$ ;  $p < 0.001$ ) and hypothesis 4 which proposed a positive relationship between consumption emotions and customer satisfaction ( $\beta = .14$ ;  $p < 0.001$ ). Corroborating the results of existing studies (e.g. Deng et al., 2013; Hyun et al., 2011; Lo et al., 2015), the significant paths revealed here reasonably justifies our motive to introduce consumption emotions in the model and reinforces the need for researchers to consider this variable in future service quality studies.

Hypothesis 5 proposing a relationship between perceived value and customer satisfaction ( $\beta = .31$ ;  $p < 0.001$ ) and hypothesis 6 postulating a relationship between service quality and perceived value ( $\beta = .35$ ;  $p < 0.001$ ) were both supported by the findings. We also found support for hypothesis 8 which proposed a positive relationship between consumption emotions and perceived value. These findings are in line with existing research (e.g. Bajs, 2015; Deng et al., 2013; Hyun et al., 2011; Oh, 1999; Ryu et al., 2008, 2012). The results allow us to conclude that accommodation guests place great importance on what is fair, right, or deserved (benefits) for the perceived costs of the accommodation offering in terms of the monetary payments and other sacrifices they made. We also agree with McDougall and

Levesque's (2000) argument that models that fail to consider perceived value provide an incomplete picture of customer satisfaction.

To test the influence of image on customer satisfaction and on perceived value, we formulated hypotheses 8 and 9 respectively. Results indicated support for both hypotheses ( $\beta = .35$ ;  $p < 0.001$ ;  $\beta = .33$ ;  $p < 0.001$ ), corroborating existing empirical evidence revealed by Andreassen and Lindestad (1998), Cretu and Brodie (2007), and Kandampully and Suhartanto (2000). Hypothesis 10 which proposed that service quality positively influences image was also supported by the study findings ( $\beta = .79$ ;  $p < 0.001$ ), confirming results of existing studies (Hu et al., 2009; Ryu et al., 2012; Tosun et al., 2015). Customers' overall impression of and beliefs about an accommodation establishment is strongly influenced by the quality of service they receive. Hypothesis 11 proposing a positive relationship between customer satisfaction and loyalty was supported by the findings ( $\beta = .65$ ;  $p < 0.001$ ). We also found support for hypothesis 12 which postulated a relationship between perceived value and customer loyalty and for hypothesis 13 postulating a positive relationship between image and customer loyalty ( $\beta = .12$ ;  $p < 0.05$ ). These results support those in existing literature on the topic (e.g. Chen and Chen 2010; Deng et al., 2013; Hu et al., 2009; Oh, 1999; Su et al., 2016).

### *5.1 Theoretical implications*

Overall, the results contribute to the theoretical and methodological debates on the measurement of service quality. Second-order models are not particularly difficult to conceptualize and test, but the hospitality literature has yet to make full use of the capabilities and insights they afford. The vast majority of studies that included service quality as a variable in a structural model (e.g. Deng et al., 2013; Oh et al., 1999), have measured the construct in such a way that they have omitted the notion that service quality is "the sum total

of a number of specific activities that make up the overall performance of a particular industry's service" (Rossiter, 2002, p.314). Consequently, these studies failed to capture the multidimensional nature of service quality, resulting in a poor measurement of the construct. Although no researchers can claim that they have fully captured the multidimensional nature of service quality (Brady and Cronin, 2001), we believe that we have come closer to measuring the construct, embedded in a nomological network. Our results provide support for the second-order factor model of service quality which comprised of ten dimensions. Such a model embodies the meaning of the first-order factors, captures the common variance across these dimensions, provides a more accurate overall assessment of the customers' evaluation of service quality, and explains a higher level of variance in the outcome variables (Brady and Cronin, 2001; Dabholkar et al., 1995; Koufterous et al., 2009). We thus provide a better explanation of its influence on customer satisfaction, image, consumption emotions, and perceived value. In line with the argument of Blut (2016), in this study, we found that the various dimensions of service quality are distinct and cannot be simply merged or deleted without changing the meaning of the construct. Future studies should consider the theoretical and methodological implications of a second-order factor approach for developing measurement scales of service quality. Such a consideration will also improve our understanding of the theoretical relationships between service quality and other outcomes variables such as image, perceived value, consumption emotions, customer satisfaction, and customer loyalty.

## *5.2 Practical implications*

The managerial implications of the study's findings are also worthy of discussion. The second-order service quality model can be of value to practitioners for improving quality of service as it allows for analysis at different levels of abstraction (Brady and Cronin, 2001). Accommodation managers interested in customers' evaluation of service on a cumulative

basis can make use of the global measure to determine service quality evaluations. They should understand that accommodation guests form their perceptions of service quality of an establishment on the basis of an evaluation on ten dimensions, but ultimately combine these evaluations to form an overall perception of service quality. From this perspective, improving service quality requires coordinated efforts from all departments such as human resource, front office, food and beverage, and housekeeping. This is what the second-order factor model is telling us. More so, managers requiring a comprehensive analysis of service quality can make use of the first-order factors to identify areas or departments requiring improvements. They can use the findings to manage the different dimensions that make-up service quality in the consumers' mind. Managers can identify the sources of service failure, isolate their origins, and make appropriate adjustments for service improvements. Such an assessment can also be made at the level of each department.

Managers should not consider improvements in the quality of service as an end in itself, but also realize that such efforts will also impact favorably on customer satisfaction, image of the establishment, perceived value, and consumption emotions as our findings suggest. These strategies will also have the effect of improving customer loyalty. They can also improve customer satisfaction and loyalty by ensuring that customers derive positive emotions from the consumption process. This can be achieved by improving the key touch points of the establishment such as the physical settings of the place and the appearance of accommodation staffs that evoke positive consumption emotions. Satisfaction and loyalty can be enhanced further by ensuring that customers derive good value from the service. Managers should develop appropriate and smart pricing strategies that provide better value to customers than their competitors. Improving the image of the organization is another strategy to enhance customer satisfaction and loyalty. Managers should however bear in mind that a poor level of service and low customer satisfaction are likely to affect the success of the

whole accommodation establishment given their relationships with other variables of the model.

### *5.3 Study limitations and direction for future research*

The findings of this study should be understood taking into account its limitations. First, although a second-order factor model is useful mainly when a global representation of a construct is required such as in a structural model, it is less useful when fine-grained analyses are needed (Bagozzi and Heatherton, 1994), such as when a detailed assessment of the level of quality of service offered by a hospitality organization is required. Secondly, a second-order factor does not allow for an understanding of the influence of each first-order factors on outcome variables such as customer satisfaction and loyalty. Thus, it is important that future researchers attempt to test such relationships to uncover those dimensions of service quality that matter most for customer satisfaction and loyalty and to determine their explanatory power. Third, although we found theoretical and empirical support for a second-order factor model of service quality, there is potential for considering service quality as a third-order factor, commonly referred to as a hierarchical model, where the first-order factors can be aggregated into a smaller set of meaningful sub-dimensions as in the research by Dabholkar et al. (1995), Brady and Cronin (2001), Dagger et al. (2007), and more recently, by Blut (2016). If researchers and practitioners are concerned with parsimony, a third-order factor model of service quality may be more appealing (Dabholkar et al. 1995). Fourth, we considered only the service quality construct as a second-order factor in our model. Future studies can enlarge our model to include other second-order factors such as image and perceived value. Finally, there is also potential for exploiting use of structural equation modeling further by conducting factorial invariance test to analyze the moderating effects of other such variables as nationality, and culture on the path relationships we tested.

## 6 Conclusion

Research on service quality in hospitality has proliferated over the past decades. While early studies were relatively descriptive and sometimes inattentive to measurement issues, recent studies have embraced advanced statistical techniques of a confirmatory nature such as structural equation modeling (e.g. Deng et al., 2013; Oh, 1999; Su et al., 2016), allowing the field to catch-up with more established disciplines such as psychology which have a long tradition of employing rigorous methodological approaches. The existing knowledge base suggests that service quality is best conceptualized as multidimensional, in which case, a second-order factor approach becomes the most suitable technique that can best represent such structures when considered in a nomological network (Koufteros et al., 2009). This paper developed a second-order service quality model which was integrated in a structural model. The model was tested using a rigorous confirmatory approach on data collected from accommodation guests in South Africa.

This paper makes an important contribution to knowledge. Although some few researchers tested service quality as a second-order factor (e.g. Wilkins et al., 2007), their approach is at best incomplete as Chin (1998) argued. To-date, we have come across very limited studies that considered a second-order service quality model within an integrative structural model comprising of key variables such as customer satisfaction, image, perceived value, consumption emotions, and customer loyalty. We provide here a theoretically rigorous approach to understanding consumer psychology. Our approach has alleviated such methodological problems as limited explanatory power and “bloated specifics” which are common to first-order factor or unidimensional treatment of a variable (see Koufteros et al., 2009). In this study, we have not only demonstrated that service quality can be treated as a second-order factor, but by integrating the construct in a structural model, we also explain higher level of variances and develop a more parsimonious model than existing studies. If



the general factor rather than the first-order factors is the main focus of the research, then the second-order factor approach to conceptualizing a variable serves a useful purpose (Chen et al., 2006).

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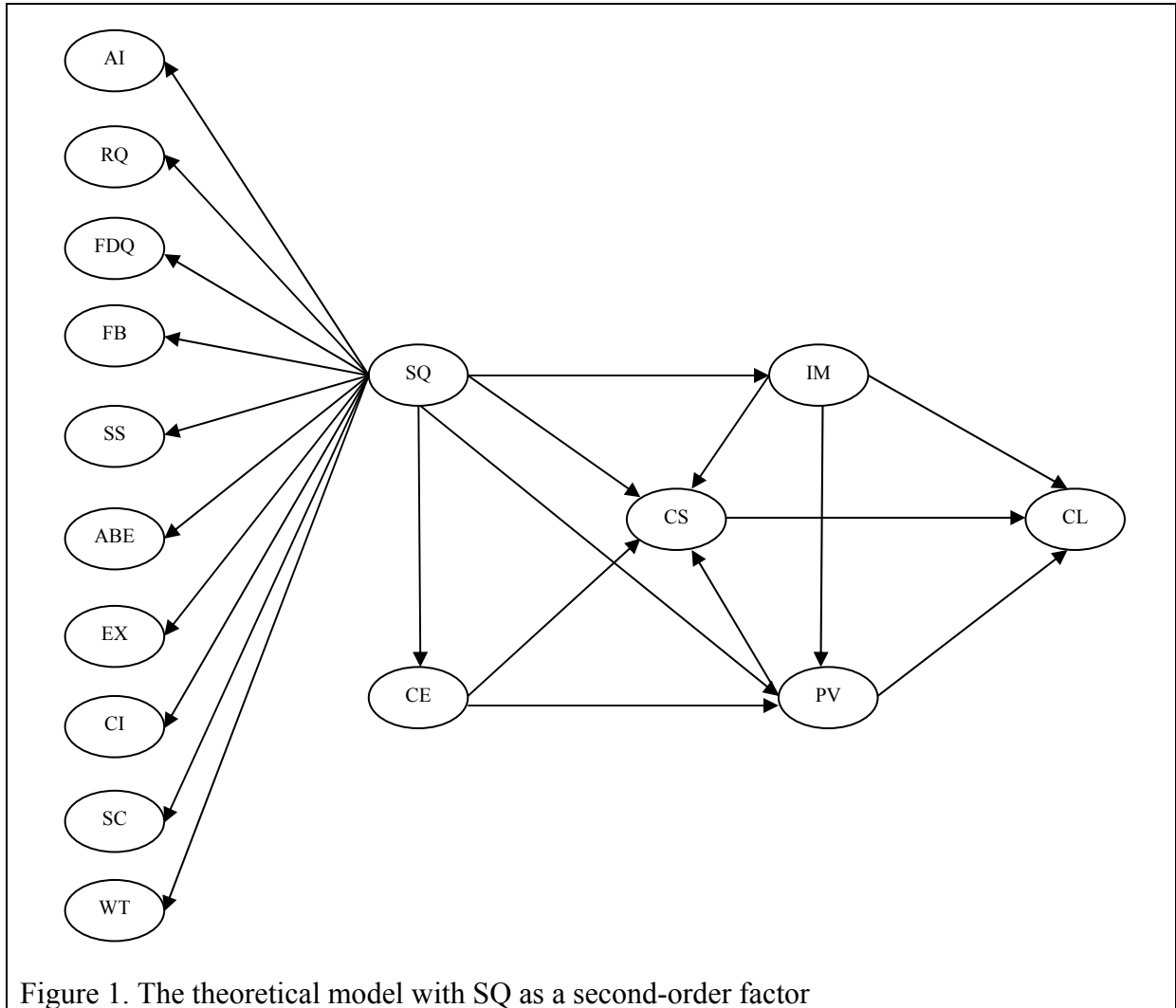
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Notes: AI - Accommodation infrastructure; RQ - Room quality; FDQ - Front desk quality; FB - Food and beverage; SS - Safety and security; ABE - Attitude and behavior of employees; EX - Expertise; CI - Customer interaction; SC - Sociability; WT - Waiting time; SQ – Service quality; PV – Perceived value; IM - Image; CE – Consumption emotions; CL – Customer loyalty; CS – Customer satisfaction

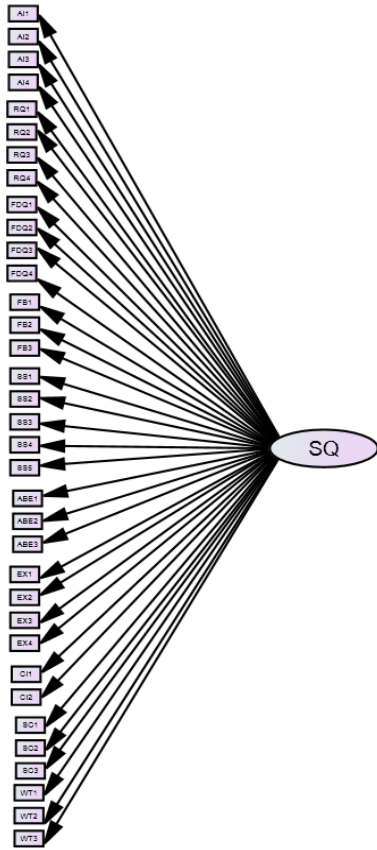


Fig 2a. One first-order factor (M1)

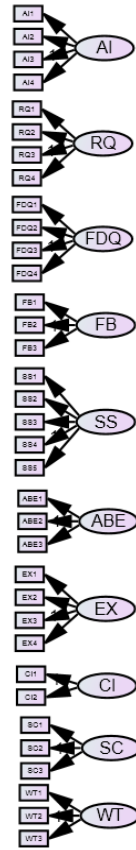


Fig. 2b: Ten first-order uncorrelated factors (M4)

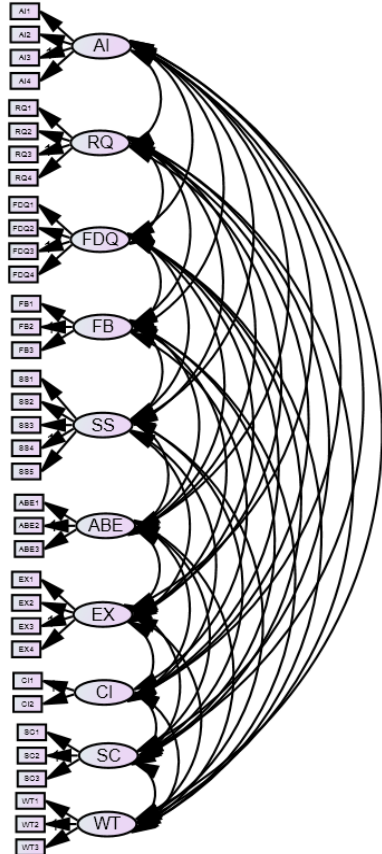


Fig. 2c. Ten correlated first-order factors (M3)

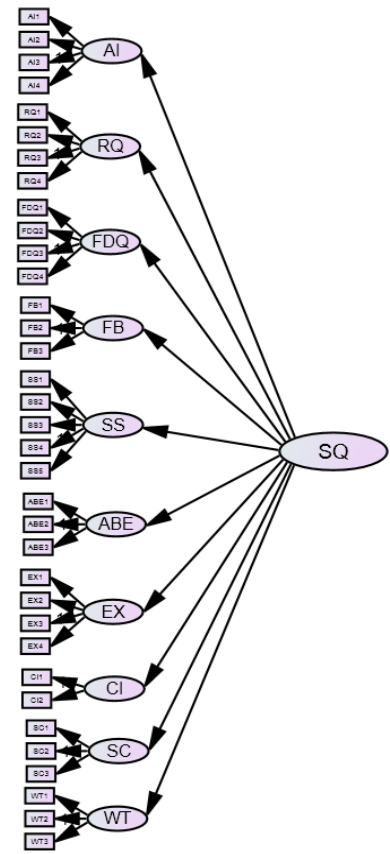


Fig 2d. Ten first-order factors, one second-order factor (M4)

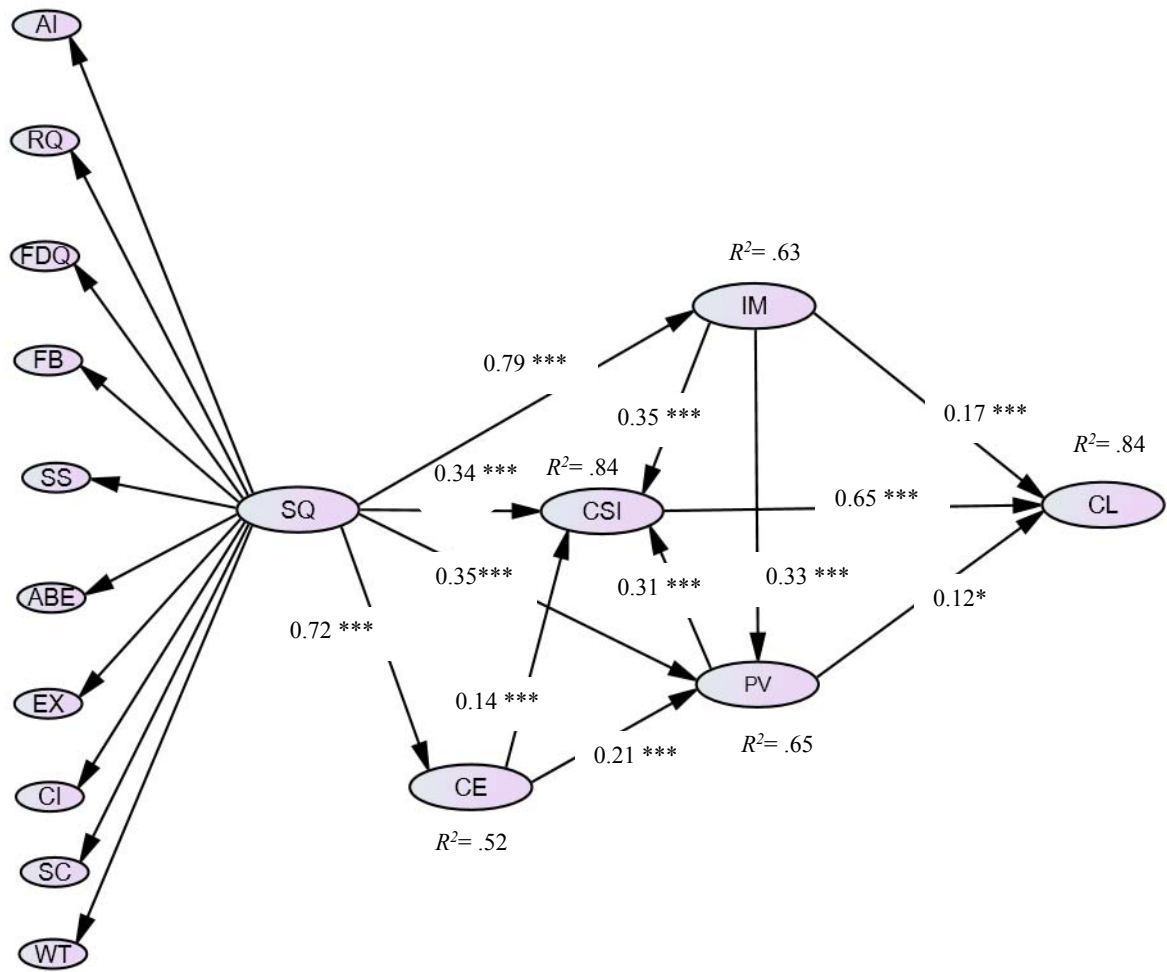


Figure 3. The tested structural equation model with standardized beta and  $R^2$  values



Table 1. Profile of respondents

Characteristics	Frequency(n)	Percentage (%)
<i>Gender (N = 672)</i>		
Male	364	54.2
Female	308	45.8
<i>Marital Status (N = 672)</i>		
Widowed	23	3.4
Single	248	36.9
Married	366	54.5
Divorced/ Separated	35	5.2
<i>Highest Level of Qualification (N = 671)</i>		
Less than high school	14	2.1
High school	59	8.8
Apprenticeship/ Trade Certificate	26	3.9
College	201	30
University	371	55.3
<i>Purpose of visit (N = 671)</i>		
Business	243	36.2
Visiting friends and relatives	73	10.9
Holidays	289	43.1
Others	66	9.8
<i>Type of Accommodation (N = 671)</i>		
Park accommodation	199	29.7
Non-park accommodation	472	70.3
<i>Nationality (N = 672)</i>		
South Africans	376	56.4
Europeans	109	16.2
Other Africans	81	12.1
Americans	55	8.2
Asians	46	6.8
Metric Variables		
	Mean ( $\bar{x}$ )	Standard Deviation(SD)
Age	39.89 years	13.284
Length of Stay	7.60 days	14.844
Number of previous visits	1.88 times	5.305

Table 2. Psychometric properties of the measurement scales for the first-order factors

First order factor and their indicators	SL	t-values	CR	AVE
<i>Accommodation infrastructure</i>			.89	.67
The style of décor is to my liking at this accommodation	.82	-		
The accommodation is generally clean	.85	25.55		
The design of the accommodation is attractive	.81	23.77		
The physical environment is what I expect in this accommodation	.81	23.90		
<i>Room quality</i>			.86	.60
The room size of this accommodation is adequate	.78	-		
The bed/mattress/pillow are comfortable	.77	20.52		
This room in this accommodation is peaceful	.79	21.11		
In-room temperature control is of high quality at this accommodation	.75	19.98		
<i>Front desk quality</i>			.81	.53
The check in procedure at the accommodation is good	.79	-		
Luggage transfer is adequate	.82	22.38		
The front desk employees are able to solve my problems	.72	10.59		
Payment of final bill payment is processed as expected	.80	21.74		
<i>Food and beverage</i>			.86	.68
The food and beverage in this accommodation are of high quality	.85	-		
Cultural differences are taken into account in the menu proposed	.79	22.69		
There are a variety of food and beverage facilities at this accommodation	.83	23.86		
<i>Safety and security</i>			.79	.53
There are accessible fire exits at this accommodation.	.61	-		
There are noticeable sprinkler systems at this accommodation	.73	13.85		
The accommodation located in a safe area	.69	13.38		
The room door has adequate security features	.61	12.25		
A secure safe is available in the room of this accommodation	.63	12.50		
<i>Attitude and behavior of employees</i>			.93	.81
The attitude of employees of this accommodation demonstrates their willingness to help me.	.88	-		
The attitude of employees of this accommodation shows me that they understand my needs.	.91	34.73		
The behavior of the employees of this accommodation allows me to trust their services	.90	33.72		
<i>Expertise of employees</i>			.93	.78
The employees understand that I rely on their professional knowledge to meet my needs	.85	-		
I can count on the employees of this accommodation knowing their jobs/responsibilities.	.87	29.70		
The employees of this accommodation managed to deal with all my needs	.91	32.46		
The employees of this accommodation are competent	.88	30.58		
<i>Customer interaction</i>			.84	.72
I am generally impressed with the behavior of the other customers of this accommodation	.87	-		
My interaction with the other customers has a positive impact on this accommodation's services	.83	22.86		
<i>Sociability</i>			.89	.73
This accommodation provides me with opportunities for social interaction	.83	-		
I feel a sense of belonging with other customers at this accommodation.	.88	26.77		
I have made social contacts at this accommodation	.85	25.83		
<i>Waiting time</i>			.92	.80
The waiting time for service is reasonable at this accommodation.	.86	-		
The employees of this accommodation understand that waiting time is important to me	.95	34.93		
The employees of this accommodation try to minimize my waiting time.	.86	29.81		

Notes: SL – standardized loadings CR – composite reliability; AVE = Average variance extracted

Table 3. Model comparison

Fit indices	Single first order factor (M1)	Ten uncorrelated first order factor (M2)	Ten correlated first order factor (M3)	Ten first order factors, one second order factor (M4)
$\chi^2$	6819.21 <sub>(559)</sub>	3698.90 <sub>(556)</sub>	1347.25 <sub>(515)</sub>	1549.56 <sub>(546)</sub>
CFI	.63	.82	.95	.95
TLI	.61	.80	.94	.95
RMSEA	.13	.09	.05	.05
SRMR	.09	.38	.05	.05
$\chi^2/df$	12.20	6.65	2.62	2.84
AIC	6961.21	3846.90	1577.25	1717.56
BCC	6969.26	3855.29	1590.29	1727.08

Notes: CFI - Comparative Fit Index; TLI - Tucker Lewis Index; IFI - Incremental Fit Index; RMSEA - Root Mean Square Error of Approximation; SRMR - Standardized Root Mean Square Residual; AIC - Akaike Information Criterion; BCC - Browne-Cudeck Criterion

Table 4. Fit indices of the overall measurement and structural models

Model	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA	SRMR	$\chi^2/df$
Overall measurement model	2834.03	1194	.94	.94	.04	.05	2.37
Structural model	2919.36	1197	.94	.94	.04	.05	2.44
Evaluative criteria	-	-	>.90	>.90	<.08	<.08	<.3

Table 5. Properties of the overall measurement model

Variables and their indicators		SL	t-values	CR	AVE
<i>Service quality (second order factor model)</i>				.93	.55
AI	Accommodation Infrastructure	.81	15.03		
RQ	Room Quality	.83	14.59		
FDQ	Front Desk Quality	.85	14.98		
FB	Food and Beverage	.71	-		
SS	Safety and Security	.70	11.17		
ABE	Attitude and Behaviors of Employees	.81	15.68		
EX	Expertise of Employees	.82	15.56		
CI	Customer Interaction	.59	12.09		
SC	Sociability	.54	11.20		
ST	Waiting Time	.75	14.72		
<i>Consumption emotions</i>				.79	.57
	I feel pleased with the consumption process	.91	-		
	I feel comfortable with the consumption process	.79	23.15		
	I feel disappointed with the consumption process (R)	.50	13.29		
<i>Image</i>				.87	.69
	I think that this accommodation has a good reputation in the region	.85	25.30		
	This accommodation has a better image than its competitors	.82	-		
	This accommodation has a good image in the minds of its customers	.83	24.38		
<i>Perceived value</i>				.93	.82
	Appropriateness of accommodation's price under given quality	.88	36.63		
	Overall value you get from your accommodation for what you give	.93	-		
	Overall value you get from the accommodation for your money	.90	38.06		
<i>Customer satisfaction</i>				.90	.75
	I feel satisfied with the accommodation's overall performance	.89	28.61		
	The performance of this accommodation has met your expectations.	.88	27.95		
	The satisfaction level of this accommodation is quite close to my ideal accommodation.	.82	-		
<i>Customer loyalty</i>				.90	.69
	Recommend the accommodation to friends and relatives	.90	26.29		
	Say favorable things about the accommodation to others	.90	26.30		
	Choose the same accommodation again if you could start all other	.78	-		
	Stay in the same accommodation in future	.71	32.11		

Notes: SL – standardized loadings; CR – composite reliability; AVE – average variance extracted; R – Reverse coded

Table 6. Discriminant validity results

Comparisons		<u>Constrained Model</u>		<u>Unconstrained Model</u>		<u>Chi-Square Difference</u>		Discriminant Validity
		$\chi^2$	df	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	
SQ	IM	1985.40	652	1845.29	651	140.11	1	Yes
	PV	1914.60	652	1779.52	651	135.08	1	Yes
	CE	1921.09	652	1744.99	651	176.1	1	Yes
	CS	1948.09	652	1805.13	651	142.96	1	Yes
	CL	2375.35	689	2213.99	688	161.36	1	Yes
IM	PV	177.62	9	23.84	8	153.78	1	Yes
	CE	202.72	9	29.81	8	172.91	1	Yes
	CS	228.42	9	46.36	8	182.06	1	Yes
	CL	496.37	14	340.4	13	155.97	1	Yes
PV	CE	173.07	9	10.02	8	163.05	1	Yes
	CS	201.94	9	46.16	8	155.78	1	Yes
	CL	459.88	14	322.29	13	137.59	1	Yes
CE	CS	304.69	9	92.61	8	212.08	1	Yes
	CL	617.85	14	434.39	13	183.46	1	Yes
CS	CL	160.84	13	91.46	12	69.38	1	Yes