

# Influence of habitual level of consumption on willingness to pay: A satiation, sensitization, and habituation approach

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## ARTICLE INFO

### Keywords:

Willingness to pay  
Habitual level of consumption  
Tourism accommodation  
Dynamic pricing  
Revenue Management  
Hospitality  
Habituation  
Satiation

## ABSTRACT

The purpose of this study is to test how Willingness to pay (WTP) change depending on habitual level of consumption (HLC), which provokes satiation, sensitization, and habituation responses. Using a longitudinal research, two questionnaires in different purchase occasions measure WTP over three consumption periods (N = 279). We find that HLC exerts an S-shaped moderating effect on WTP, which change from a previous purchase setting relative to new and repetitive purchase. The results show how WTP increases relative to previous consumption if the HLC is moderate (sensitization). However, WTP decreases relative to previous consumption if the HLC is low (satiation) or high (habituation). Regarding implications, these findings can help revenue managers to implement segmentations according HLC to optimize the value captured from customers in each purchase. Besides, we demonstrate empirically the key influence of HLC on WTP, of we know of no applications to specific products or services.

## 1. Introduction

The difference between consumers' willingness to pay (WTP) and the charged price is an indicator of opportunity costs incurred by companies in their revenue management strategy (Abrate et al., 2019). If companies can determine how WTP changes for each transaction, they could use that information to create more profitable dynamic pricing policies. Service providers, including those specializing in tourist accommodations (e.g., Booking.com, Airbnb) and transportation (e.g., Ryanair, Skyscanner), already use these strategies to improve profitability. Zhang and Lu (2013) and Choe et al. (2018) compare the profitability of pricing using different methods and conclude that dynamic pricing, compared with alternative approaches, improves income significantly. Abrate et al. (2019) report a similar result in the tourism accommodation sector.

To further understanding of dynamic pricing strategies, we study WTP in relation to the habitual level of consumption with a product/

service. Habitual level of consumption (HLC) reflects consumers' level of familiarity or experience with a product category (Wathieu, 2004). The novelty of the study lies in the identification of a nonlinear, moderating effect of habitual level of consumption (HLC) on change in WTP in the immediately previous purchase compared with a new purchase in the same product category. This implies some useful suggestions for revenue managers to improve their customer segmentation and pricing strategy models; it also makes an empirical contribution by examining HLC, a key influence on WTP. This effect has been cited in microeconomics to explain utility functions (Baucells and Sarin, 2010; Wathieu, 2004), but we know of no empirical applications to specific categories of products/services.

To this end we chose tourist accommodations, as a sector that can benefit from this knowledge, because a recent article from Razavi and Israeli (2019) highlights the discrepancy between the observed price of a hotel and consumers' WTP. These researchers propose that the estimation of prices in the tourist accommodation sector improves if nonlinear

*Abbreviations:* WTP, Willingness to pay; HLC, Habitual level of consumption.

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<https://doi.org/10.1016/j.ijhm.2022.103210>

Received 20 April 2021; Received in revised form 24 November 2021; Accepted 26 March 2022

Available online 13 April 2022

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models, a reference price, and intrinsic consumer variables (e.g., frequency, intervals between consumption) are taken into consideration. This suggestion encourages to ascertain that, in repetitive consumption services, such as tourist accommodations, it is not enough to segment consumers based on the price or WTP of the last purchase occasion. Because it presupposes that the consumer maintains an inertia in their preferences that we demonstrate does not always take place, which causes a loss of attractiveness in the value proposal. Segmenting the market based on the last price paid or its past WTP forgets the intrinsic variables of the consumer that will be considered in their next purchase decision; specifically, the HLC. We demonstrate that the predisposition towards the price between two purchases changes significantly depending on the consumer's HLC in relation to a product category. We show that this behavior occurs regardless of the tourism accommodation type (Hotel room, entire apartment, or private room in apartment) or category (1–5 stars or equivalent). Therefore, when proposing a price to the tourist accommodation client, it is necessary to include the HLC as a relevant variable. Consumers with a moderate HLC show a positive relationship between WTP in the immediately previous purchase versus a new repetitive purchase in the same product category. On the other hand, consumers with a high or low HLC shows a negative relationship between the two purchases. Consequently, given that consumer WTP changes once a new purchase has been enjoyed, it is necessary to update the offeror value proposal in the subsequent periods. The results lead us to recommend maintaining or even increasing the price offered to consumers with moderated HLC (keeping constant the rest of variables). In turn, for consumers with high or low HLC the perceived benefit should be increased to maintain consumer appealing to the accommodation, for example, offering a variety of services.

Two contributions to tourism research offer summaries of the variables influencing prices in tourist accommodation studies. [Abrate and Viglia \(2016\)](#) point out that hotels set prices by considering contextual, tangible, and reputational attributes, then [Vives et al. \(2018\)](#) indicate that these prices are optimized according to the reservation date, rate fences, type of tourist, seasonality, reservation system, and hotel differentiation. Despite extensive literature on hotel pricing determinants and revenue management from the offeror's point of view ([Abrate et al., 2011](#); [Abrate and Viglia, 2016](#); [de la Peña et al., 2016](#); [Espinete-Rius, 2018](#); [Hung et al., 2010](#); [Kuminoff et al., 2010](#); [Masiero et al., 2015a](#); [Riasi et al., 2017](#); [Rigall-I-Torrent and Fluvià, 2011](#); [Schamel, 2012](#); [Wong, 2013](#)), consumer WTP still needs attention. Even with the increased use of dynamic pricing, researchers have not estimated changes in WTP for different consumers at distinct product or service purchasing moments. Therefore, we still require insights into variables intrinsic to consumers, which explain an important variability in WTP ([Razavi and Israeli, 2019](#)), as HLC does.

The habit formation model proposed by [Wathieu \(2004\)](#) and the subsequent extension in the habit formation and satiation model proposed by [Baucells and Sarin \(2010\)](#) establish the theoretical framework to explain the change in WTP over each purchase period according to HLC. Building on these models to achieve our research goal, we address three key issues. First, we demonstrate the explanatory capacity of theories of habit formation and satiation proposed by [Baucells and Sarin \(2010\)](#) and [Wathieu \(2004\)](#). We prove that the HLC has an S-shaped moderating effect on WTP for a tourist accommodation that does not vary between one consumption ( $t - 1$ ) event and the next ( $t/t + 1$ ) in category or type. The moderating effect is explained by the different responses of consumers to perceptions of satiety, sensitization, and habituation.

Second, to achieve the first issue, we must demonstrate empirically that WTP for a new purchase is influenced by the WTP the consumer exhibited in a previous purchase period. Reference prices play an important role in explaining WTP, but they are not a measure of the perceived benefit of a product ([Nieto-García et al., 2017](#)). This conceptualization leads us to think that if we want to capture consumer surplus in each consumption period, we must first consider a measure

that monetarily reflects the previous experience (WTP) and then take it as a reference to assess how changes. This approach is consistent with prior theoretical studies which indicate that WTP in the current period likely is influenced by previous consumption decisions ([Baucells and Sarin, 2010](#); [Roy et al., 1996](#); [Wathieu, 2004](#)).

Third, perceived benefit is a dynamic variable experienced before purchase, at the time of purchase, during use, and after use ([Sánchez et al., 2006](#)). This understanding leads us to consider WTP over three periods:  $t - 1$ , or WTP following the last consumption ( $WTP_{t-1}$ );  $t$ , or the current purchase WTP before present consumption occurs ( $WTP_t$ ); and  $t + 1$ , or WTP after current consumption ( $WTP_{t+1}$ ). Our results shows that  $WTP_t$  mediates the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ .

## 2. Literature review

### 2.1. Pricing and WTP in tourism accommodations

Revenue management research offers two predominant frameworks: hedonic pricing and consumer behavior. The former stream of research details how tourism accommodation providers set prices in each period. The latter stream takes the consumer's point of view to explain WTP. Despite the different approaches, both streams provide relevant information and useful models, as we summarize in [Table I](#). We contribute by proposing a model that includes both previous consumption experience and the consumer's personal context, in terms of HLC, to explain WTP.

### 2.2. WTP, experience effect, and HLC

[Cameron and James \(1987\)](#) define WTP as the monetary amount that a consumer agrees to pay for a product or service. Thus, WTP reflects the benefit that a consumer perceives he or she will get from the product ([Kotler and Levy, 1969](#)). In product categories for which purchases are repeated over time, such as tourist accommodations, purchasing behavior is influenced by consumers' experiences and habits ([Roy et al., 1996](#)). In turn, the HLC reflects familiarity or habituation with a product; it is determined by the number of times a product category has been consumed in a specific period of time. This variable influences WTP in a

**Table I**  
Review of Academic Models on Pricing in the Tourist Accommodation Sector.

Explicative Model	Relevant Information to Explain Prices/WTP	Authors
Accommodation centered	Tangible: hotel category and general attributes, location, number of rooms, accessibility to public-private services, and amenities Intangible and reputational: hotel services, service quality based on reputation, reputation, brand awareness-innovations	<a href="#">Espinete et al. (2003)</a> , <a href="#">Rigall-I-Torrent and Fluvià (2011)</a> , <a href="#">Heo and Hyun (2015)</a>
Competitive context	Competition prices/economic situation, occupation, price elasticities, spatial agglomeration, vertical and horizontal differentiation	<a href="#">Thrane (2007)</a> , <a href="#">Kuminoff et al. (2010)</a> , <a href="#">Abrate et al. (2011)</a> , <a href="#">Masiero, Heo et al. (2015)</a> , <a href="#">de la Peña et al. (2016)</a>
Consumer centered	Booking advance and customers' search cost, satisfaction and loyalty, sociodemographic and self-perception, days of stay, e-WOM, internal reference price, cocreation engagement, and skepticism, consumer satiation	<a href="#">Enz et al. (2009)</a> , <a href="#">Koushik et al. (2012)</a> , <a href="#">Balaguer and Pernías (2013)</a> , <a href="#">Becerra et al. (2013)</a>
Proposed model	Previous consumption experience, consumer's personal context in terms of habitual level of consumption	<a href="#">Schwartz (2000)</a> , <a href="#">Xu and Gursoy (2015)</a> , <a href="#">Losada et al. (2016)</a> , <a href="#">Riasi et al. (2017)</a> , <a href="#">Nieto-García et al., (2020, 2017)</a> , <a href="#">Tu et al. (2018)</a> , <a href="#">Yin et al. (2020)</a> , <a href="#">Becerril-Castrillejo and Muñoz-Gallego (2022)</a> <a href="#">Baucells and Sarin (2010)</a> , <a href="#">Wathieu (2004)</a>

nonlinear way and causes the utility to vary positively (sensitization) or negatively (satiation - habituation) in the next purchase period, depending on whether HLC is moderate or low/high, respectively (Wathieu, 2004). As it is shown in Fig. 1.

2.3. WTP across consumption periods ( $WTP_{t-1}$  and  $WTP_{t+1}$ )

Customers use individual internal rules to judge prices (Cheng and Monroe, 2013). Tourism consumers tend to rely on anchors for their price judgments (Tanford et al., 2019), such as observed prices for a room (Pan et al., 2013; Tanford et al., 2019). When attitudes are used to predict actions, integrating past experiences significantly improve predictions (Norman et al., 2000). Past experiences with a service also differ for each consumer and lead to heterogeneous levels of customer awareness (Moon et al., 2006), as well as varying WTP for the same product. The term  $WTP_{t-1}$  captures the assessed perceived benefits of a past consumer experience. We propose that when a purchase is repetitive, assessments of prior consumer experience significantly influence predispositions toward the new purchase.

Mathematically, Wathieu (2004) predicts that the HLC (follows an adaptive process, as follows:

$$\overline{HLC}_{t+1} = f(\overline{HLC}_{t-1}, x_{t-1}),$$

where  $x_{t-1}$  (purchase in the previous period) is positively related to  $WTP_{t-1}$  and therefore to  $\overline{HLC}_{t+1}$  (current HLC). Furthermore, Wathieu (2004) proposes:  $WTP_{t+1} = f(\overline{HLC}_{t+1})$ , being  $\overline{HLC}_{t+1} = \alpha * x_{t-1} + (1 - \alpha) * \overline{HLC}_{t-1}$ . Therefore, we conclude that:

$$WTP_{t+1} = f(WTP_{t-1}),$$

where  $WTP_{t+1}$  is a function of  $\overline{HLC}_{t-1}$  and  $x_{t-1}$  and, therefore,  $WTP_{t-1}$ . In turn, we predict  $WTP_{t-1}$  influences both  $WTP_{t+1}$  and the HLC on period  $t + 1$ . If WTP is related to the HLC, we can infer that WTP in the two moments of time are related, which leads to our first hypothesis:

H1.  $WTP_{t-1}$  influences  $WTP_{t+1}$ .

2.4. Influence of  $WTP_{t-1}$  over  $WTP_t$

To establish  $WTP_t$ , which arises at the moment the consumer purchases or reserves the product again, a rational consumer might consider:

- a) Current observed prices and those remembered from previous purchase occasions. The prices observed in past purchase occasions, especially the final price paid, help the consumer establish an internal reference price, and the most influence stems from the price corresponding to the last purchase (Nasiry and Popescu, 2011).
- b) Past consumer experiences. If the past experience was in line with the consumer's expectations, the consumer will keep this expectation as a guide for the next purchase decision. Therefore, the consumer will maintain a WTP, if he or she considers only the price paid in the last purchase decision as a reference price or adjust that WTP to the reference price change. Analyzing WTP formation, Goes et al. (2010) establish that for continuous consumption of the same product, updates to the WTP occur, in large part, due to the experiences a consumer had in previous purchases. The closer these experiences and prices are in time, the more influence they have on WTP (Nieto-García et al., 2017). Therefore, we assert that consumers learn and modify their WTP based on the closest experience.
- c) Personal contextual factors, such as change in budget, change in booking method, seasonality, or altered family context.

For repetitive consumer purchases that take place in a relatively short space of time—as occur in the category of tourist accommodations—the variation in the reference price between one purchase and the next, as well as any changes in personal and family context, may be minimal. In that case, the WTP may persistently explain an important part of the new purchase. Therefore, for repetitively purchased consumer products, we expect  $WTP_{t-1}$  to explain a significant part of  $WTP_t$ .

H2.  $WTP_{t-1}$  influences  $WTP_t$ .

2.5. Partial mediation of  $WTP_t$

$WTP_t$  offers an indicator of the benefit a consumer receives before booking, that may differ from  $WTP_{t+1}$ , because the last includes the experience of using the product or service. According to heuristic processing theory (Kahneman, 2011), when a consumer is familiar with a product, the information gathered to evaluate the price is broader in scale than would be the case for consumers who are not familiar with a product or service. For repetitive purchases, an internal reference price exists, and some automatic rules are followed, reducing the signals to the most recent price (Tanford et al., 2019). So, repetitive customers consumers have expectations that determine their perception of a service performance (Olshavsky and Miller, 1972) and therefore their  $WTP_{t+1}$ .

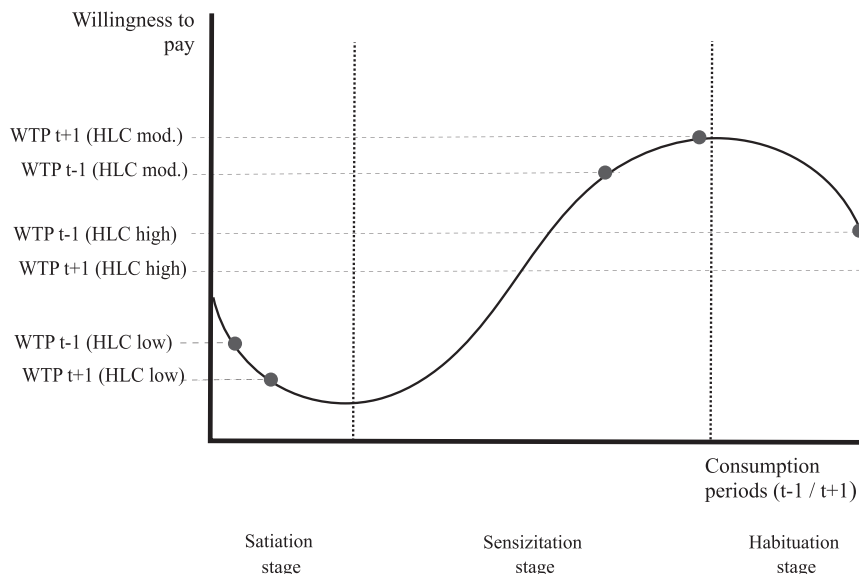


Fig. 1. Moderator Effect of Habitual Level of Consumption (HLC) in WTP between Two Consumption Periods.

Assimilation theory asserts that consumers try to avoid discrepancies between expectations and performance perceptions a posteriori (Anderson, 1973), by searching for information before purchasing or by resorting to past experience when relevant (Pieters et al., 1995). For example, more positive comments or a good prior experience can generate more favorable expectations about the benefits of purchasing the product or contracting the service, which lead to greater  $WTP_t$  (Nieto et al., 2014; Nieto-García et al., 2017). According to the assimilation effect, this influence manifests as a predisposition to positively value the consumption experience, which should increase  $WTP_{t+1}$ . Thus:

**H3a.**  $WTP_t$  influences  $WTP_{t+1}$  positively.

According to H1 and H2,  $WTP_{t-1}$  is an antecedent of  $WTP_t$  and  $WTP_{t+1}$ , so we also posit:

**H3b.**  $WTP_t$  partially mediates the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ .

## 2.6. Habituation, sensitization, and satiation as moderators

In this study, travel frequency in a two-year period serves as a proxy for the HLC. Cognitive researchers argue that previous propensities are not always a good predictor, though in certain conditions, such as in a mature market, they can explain future behaviors (Bamberg and Schmidt, 2003). Therefore, we argue that in the tourism sector, the propensities of consumers to produce the same responses are influenced by previous patterns (Ehrenberg, 1996), so we consider the HLC (frequency) as a predictor of experience and familiarity, while controlling for the notion that cognitive variables do not change significantly in brief consumption periods.

The assessment of WTP for repetitive consumption in different periods of time involves three phases of response: sensitization, habituation, and satiation. In these phases, the loss evaluation from having not consumed and the gain from having consumed fluctuate, thus moderating changes in WTP between periods of consumption (Wathieu, 2004).

### 2.6.1. Sensitization stage

Sensitization implies a positive response to a stimulus due to exciting perceptions arise when people face a moderate HLC. In this phase, people still value a product or service as stimulating, which translates into higher WTP. The theorem of interior maximum proposed by (Wathieu, 2004, p. 590) states that “perceived value is greater when the consumer is in an intermediate of familiarity with a product, because at this point the consumer experiences the sharpest contrast between the perceived gain from consuming and the perceived loss from not consuming.” Several examples in prior literature suggest this behavior of sensitization: In the tourist accommodation context, loyal customers express significantly higher brand preferences for certain hotels and are willing to pay extra for them (Mathies and Gudergan, 2012). Xu and Gursoy (2015) conclude that loyal consumers are willing to pay extra for a hotel room, though loyal consumers also might display more novelty-seeking search patterns (Jang and Feng, 2007), which would lead to lower WTP in the next purchase compared with the same service, previously purchased. Contrary to previous results, Masiero, Heo et al. (2015) conclude that first-time visitors (vs. repeat visitors) perceive WTP for various attributes of the same hotel differently, such that they are willing to pay significantly more for most features in their next consumption episode.

Therefore, to understand the influence of HLC over WTP, it is important to know not only the behavior of loyal consumers, which is not clear, but also the different groups that exist, according to their travel frequency. Moderate consumption can also be associated with

variety-seeking patterns—that is, strategies to change the brand or product category as a method to maintain moderate consumption from a product and consequently the desire to purchase a product over time (Sevilla et al., 2019). In this way, consumers intersperse alternatives with their preferred product and do not lose interest. Because they do not get used to consumption, the perceived utility associated with making new purchases does not decrease (Roy et al., 1996). Assuming repetitive purchases, at a moderate HLC in the sensitization phase, we expect that  $WTP_{t+1} > WTP_{t-1}$ .

### 2.6.2. Habituation stage

Consumers develop habits when they regularly repeat the same behavior in similar situations, which persists despite a relative loss of enthusiasm over time. Habituation refers to the diminished response to a stimulus that has been repeated over time, and behavioral theories indicate that stimuli that have been experienced continuously over a long period lose value (Castellucci et al., 1970; Groves and Thompson, 1970).

In this phase, the HLC is close to its maximum level, and interest in consuming is practically null. The product or service in question is simply consumed to avoid the perceived loss from not consuming it or consuming it less frequently. In periods of high consumption, consumers tend to decrease their WTP respect the previous purchase (Wathieu, 2004). Seeking proof of this loss of value in the tourist accommodation sector, Tu et al. (2018) cannot confirm that a higher frequency of consumption leads to higher WTP. Kozak and Rimmington (2000) also find no evidence of greater satisfaction among repeat versus first-time visitors, and Kozak et al. (2004) even suggest a minor satisfaction withing repeaters. Nieto-García et al. (2020) propose an inverted U-shaped relationship between consumption frequency and WTP, such that the relationship between frequency and familiarity increases WTP only up to approximately six visits to a tourist accommodation in a period of 24 months and declines for higher values. Consequently, assuming a high level of repetitive consumption in the habituation phase, we expect that  $WTP_{t+1} < WTP_{t-1}$ .

### 2.6.3. Satiation stage

Satiation reduces interest or enjoyment in a stimulus in the next period, especially when customers are not habituated to a good—that is, when the HLC is low. Satiation is a feeling of moving beyond a desire or capacity for more of something in a given moment, which diminishes further enjoyment in consumption (Baucells and Sarin, 2007). A large dinner is less attractive after a large lunch, especially when a person is not used to that HLC. This effect is an extension of habit formation model. In the initial period of consumption, habituation to consumption is relatively low, increasing consumption levels satiate customers, causing a decrease in desire. Novice visitors to a tourist destination or accommodation are less likely to revisit that destination than repeat visitors, even when they are satisfied (Kozak, 2001; Kozak et al., 2004; Sampol, 1996). Sevilla et al. (2019) study how consumers try to balance repeating the same choices with the decision to seek variety as a means of maximizing utility over time and conclude that variety seeking is consequence of a satiation effect. In turn, variety seeking, and thus satiation reduces WTP for subsequent purchases with respect to the same product or service previously used (Sajeesh and Raju, 2010; Becerril-Castrillejo and Muñoz-Gallego, 2022). As De-Magistris and Gracia (2016) conclude, WTP with respect to a certain future meal is higher for those who are currently hungry than for those who are satiated. Assuming continued consumption and a low HLC in the satiation phase, we expect that  $WTP_{t+1} < WTP_{t-1}$ . Furthermore,

**H4.** The habitual level of consumption has an S-shaped moderating

effect on the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$  (Fig. 2).

That is, we expect a different influence of  $WTP_{t-1}$  on  $WTP_{t+1}$  depending on the HLC (see Fig. 1). From H4, we derive the following secondary hypotheses:

**H4a.**  $WTP_{t-1}$  negatively influences  $WTP_{t+1}$  when there is a low habitual level of consumption.

**H4b.**  $WTP_{t-1}$  positively influences  $WTP_{t+1}$  when there is a moderate habitual level of consumption.

**H4c.**  $WTP_{t-1}$  negatively influences  $WTP_{t+1}$  when there is a high habitual level of consumption.

### 3. Methodology

#### 3.1. Data sampling

We conducted a longitudinal study involving two sequential purchases from an online panel of Spanish customers. In the first questionnaire we identify people who, in the previous two years, have stayed at least once in a tourist accommodation for leisure reasons and planned to enjoy a new accommodation, in the same category and type, again in the coming weeks. In this first questionnaire we asked participant for their previous purchases  $WTP$  ( $WTP_{t-1}$ ), their  $WTP$  before consuming the current accommodation ( $WTP_t$ ), and their habitual level of consumption (HLC), among other control variables. According Bigne et al. (2021), the average advance booking is 27 days. So, the respondents received a second questionnaire after 25 days that collected data after their stay in the current tourist accommodation ( $WTP_{t+1}$ ). Obtaining a population really involved in tourism accommodation purchases, we expect answers that accurately reflect stated preferences and  $WTP$ 's evaluations (Breidert et al., 2006).

To achieve a representative sample of the population, we obtained an initial random sample of 1750 people, setting quotas by sex, age, and place of residence in accordance with the population register of the Spanish National Institute of Statistics. A total of 410 individuals responded positively to the first filter question; that is, they were planning to use a tourist accommodation similar in type and category to a previous stay sometime in the next 25 days. Respondents to this first questionnaire received a second questionnaire after 25 days that collected data after the stay in the tourist accommodation ( $WTP_{t+1}$ ). A total of 370 people responded to this second questionnaire. After removing questionnaires with incomplete or incoherent answers, the sample was reduced to 289 respondents. Finally, we applied Chauvenet's criterion, which discards variations in  $WTP$  between different time periods that exceed  $\pm 3$  times the standard deviation (Zerbet and Nikulin, 2003) to eliminate changes in  $WTP$  that may be motivated by misinterpretation. The final sample comprised 279 respondents, whose profile is reported in Table II.

#### 3.2. Measures

##### 3.2.1. WTP

To measure  $WTP$ , we chose a double-bounded dichotomous choice methodology consisting of two "yes/no" questions about variations

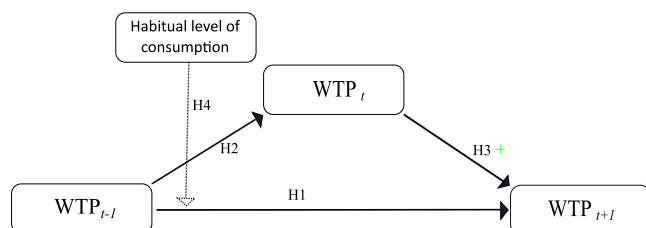


Fig. 2. Conceptual Model.

Table II Sociodemographic Characteristics of Respondents.

Characteristics	n	%
Gender		
Male	124	44.4%
Female	155	55.6%
Age		
18–24 years	21	7.5
25–34 years	62	22.2
35–44 years	81	29.0
45–54 years	63	22.6
55–65 years	52	18.6
Education		
Secondary education	19	6.6
High school	107	37.4
University or higher	153	56.1
Monthly income		
Rather not answer	33	11.8
< 1.800€	75	26.9
1.800€– 3.000€	86	30.8
> 3.000€	85	30.5
Occupation		
Employed	212	76.0
Unemployed	67	24.0
Total	279	100%

( $\pm 10\%$ ) in  $WTP$  with respect to a price reference set according to the participant's own experience. Depending on the answers, respondents then accessed an open question that asked them to quantify their  $WTP$ . This methodology has been used in previous studies on tourist accommodations (Nieto-García et al., 2017, 2020) and other topics (Li and Meshkova, 2013). We asked participants to express  $WTP$  in terms of price per double/single room per night and person (without extra expenses).

We conducted analysis to ensure that consumer's  $WTP$  change between previous consumption ( $WTP_{t-1}$ ) compared to current consumption ( $WTP_t / WTP_{t+1}$ ). There are significant changes and the average interval between consumption periods is 5 months. In turn, is reported significant change between  $WTP_t$  and  $WTP_{t+1}$ , which reflect the usages generated value.

##### 3.2.2. Habitual level of consumption

HLC is the number of times a product or service is consumed or enjoyed in a period of time (Wathieu, 2004). In the first questionnaire we asked respondents through an open question about the number of times in the past twenty-four months they had enjoyed an accommodation of the same category and type as the one they were currently deciding to book (consumption frequency). Thus, it is a measure of the usage habit of tourist accommodations for leisure purposes. Last twenty-four months period is chosen according to (Nieto-García et al., 2020) to obtain sufficient variability in the sample. In turn, it is a recent and long enough period to identify accurately the HLC of each respondent.

This measure implies an external specification of HLC, in which the habitual levels of consumption (high, moderate, low) are determined by the history of aggregate consumption of tourist accommodations, not the history of individual consumption. Finance literature indicates that an external specification, compared to internal specification of HLC does not imply a transcendent change (Campbell and Cochrane, 1999).

##### 3.2.3. Control variables

We considered various control variables to isolate the behavior of different factors that may contribute to a change in  $WTP$  for reasons other than the HLC. To maintain homogeneity in the accommodation, we established a requirement in both questionnaires for maintaining the category (1–5 stars or equivalent) and type of accommodation previously booked (Hotel room, entire apartment, or private room in apartment). To control this requirement, it was asked in both consumption

periods the category and type of accommodation booked. Questionnaires with inconsistent responses between the two questionnaires were removed from the sample. These control questions allow to extrapolate the results to different tourism accommodation independently of the category booked. Besides, in the analysis model, we include variables that likely affect frequency of use and WTP: type of tourist (national vs. foreign), holiday period (seasonality), income (monthly income), and reservation system (Internet vs. Traditional Operators) (Vives et al., 2018).

3.3. Estimation procedure

We first tested the hypotheses using a moderated hierarchical regression analysis, a special form of a multiple linear regression analysis in which variables are added to the model sequentially in separate steps to statistically investigate the significance of a moderating effect, and the moderated model's explanatory capacity improvement (Anderson, 1986). This regression analysis was conducted by RStudio (v3.5.2), using MASS and ISL libraries.

We include both  $WTP_{t-1}$  as  $WTP_t$  and  $WTP_{t+1}$  in the model after a logarithmic transformation to normalize their distributions (Wooldrige, 2018, pp. 191–216; Zhang et al., 2011). Logarithmic transformations were examined for normality by inspecting histogram graphs, skewness and kurtosis. These statistics, that are shown in Table VIII of appendix A, are within acceptable range of  $\pm 2$  (Losada et al., 2016).

To reduce multicollinearity, the moderating variable (HLC) is centered with respect to the mean before creating the interaction terms (Cotes-Torres et al., 2012). In turn, to control for multicollinearity associated with a cubic regression model, the models with square and cubic relationships are predicted by orthogonal polynomials (Cotes-Torres et al., 2012; Homburg et al., 2005) using the "ln" function in RStudio (R Team, 2013, p. 412). Orthogonal polynomials variables are new predictor variables that consist of linear combinations of the simple polynomials, which avoid any multicollinearity (Kleinbaum et al., 2013, p. 412).

To check non-multicollinearity in predicted models, Variance Inflation Factors of variables included in model 6 are reported in table X of appendix A. All statistics are below 6 indicating, according to other research in pricing and WTP, that multicollinearity is not a concern (Nieto-García et al., 2017; Wang and Nicolau, 2017).

The second block of analysis is the mediated moderation (Hayes, 2018). With this analysis, we can explore mechanisms that explain the total moderation effect of the HLC on the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ . To quantify the total effect of moderation, we estimate the effect of  $WTP_{t-1}$  on  $WTP_{t+1}$ , conditional on the HLC, and we test the significance of this effect.

Table III  
Direct Effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  and the Moderating Effect of Habitual Level of Consumption.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	—	—	—	—	—	—
$WTP_{t-1}$	.555 ***	.562 ***	.563 ***	.570 ***	.573 ***	.353 ***
Habitual level of consumption		.061	.061	.045	.075 ***	.069
Habitual level of consumption <sup>2</sup>		-.060	-.060	-.087	-.054	-.047
Habitual level of consumption <sup>3</sup>			-.015	-.044	-.009	.001
$WTP_{t-1} \times$ Habitual level of consumption				.066	.075	.064
$WTP_{t-1} \times$ Habitual level of consumption <sup>2</sup>				.061	.037	.050
$WTP_{t-1} \times$ Habitual level of consumption <sup>3</sup>					-.128 *	-.143 *
$WTP_t$						.252 *
Adjusted R <sup>2</sup>	.305	.308	.306	.307	.317	.331
Change in R <sup>2</sup>	.305	.003	.000	.001	.010 *	.014 **
F-value (d.f.)	123,518 *** (1)	42,313 *** (3)	31,653 *** (4)	21,531 *** (6)	19,475 *** (7)	18,21 *** (7)

Notes: Standardized regression coefficients are reported. Significance level: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

4. Results

4.1. Direct and indirect effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  and the moderating effect of HLC

Moderated hierarchical regression analysis is shown in Table III, whose results analyze the direct effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  and the moderating effect of HLC over this relationship. To test hypothesis H1, the main effect of  $WTP_{t-1}$  is entered in model 1, where it is shown a positive and significant effect over  $WTP_{t+1}$ . Model 2 and model 3 includes the direct effect of HLC, HLC<sup>2</sup> and HLC<sup>3</sup> on  $WTP_{t+1}$ , with non-significant results neither significant improvement in Adjusted R-squared value, so we reject a direct effect from HLC on  $WTP_{t+1}$ . To test the cubic-moderating effect, firstly it is important to check the lower order moderating effects of HLC and HLC<sup>2</sup>. The interaction terms are entered in model 4, where it is shown non-significant coefficients, nor significant improvement in adjusted R-squared value. Model 5 test the signification of a cubic moderating effect of HLC, as proposed in H4. In this model it is shown that the interaction term ( $WTP_{t-1} \times$  Habitual level of consumption<sup>3</sup>) is significant. In turn, there is a significant change in adjusted R-squared value compared to previous models, and adjusted R-squared values indicate that Model 5 explains 31.7% of the variability. From these results it is concluded that exist a cubic moderating effect of HLC, and therefore H4 is accepted.

To test the significance of the indirect effect, we follow Baron and Kenny (1986) procedure. Table IV shows that  $WTP_{t-1}$  has a significant effect on  $WTP_t$ , in support of H2. The results in Table V also provide support for H3a ( $\beta = 0.229 *$ ), and thus it is accepted a positive influence of  $WTP_t$  on  $WTP_{t+1}$ . Moreover, it is observed a significant change in the coefficient relating  $WTP_{t-1}$  to  $WTP_{t+1}$ , as well as the explanatory capacity, when we include  $WTP_t$  in Model 2. Therefore, we accept H3b. We further verify this mediating effect using SPSS Amos Graphics (v.23) through a path analysis with bootstrapping (5000 interactions). The results are significant ( $p < .05$ ). Therefore,  $WTP_t$  exerts a partial mediation effect.

According to moderate hierarchical regression analysis, as  $WTP_t$  exerts a mediating effect, there must be included this variable in a new step to check its explanatory capacity and significance in a joint model.  $WTP_t$  is entered in model 6 of Table III, where it is shown its

Table IV  
Effect of  $WTP_{t-1}$  on  $WTP_t$ .

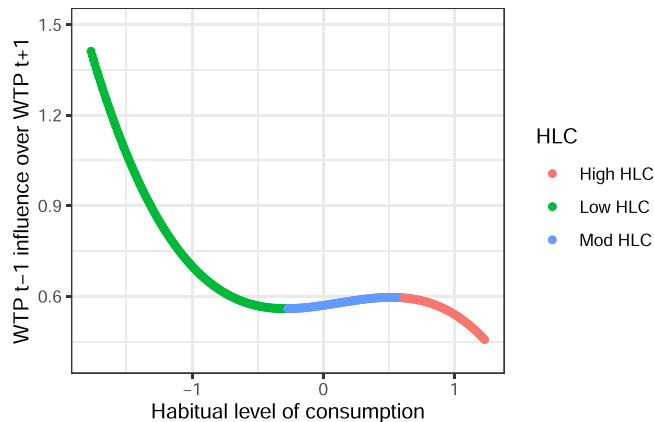
Variable	$WTP_t$
$WTP_{t-1}$	.861 ***
Adjusted R <sup>2</sup>	.740
F-value (d.f.)	793.5 ***

Notes: Standardized regression coefficients are reported. Significance level: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

**Table V**  
Mediating Effect of  $WTP_t$  in the Relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ .

Variable	Model 1	Model 2
Constant	—	—
$WTP_{t-1}$	.555 ***	.358 ***
$WTP_t$	—	.229 *
Adjusted R <sup>2</sup>	.305	.317
Change in R <sup>2</sup>	.305	.012 *
F-value (d.f.)	123.51 ***	65.524 ***

Notes: Standardized regression coefficients are reported. Significance level: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .



**Fig. 3.** Effect of  $WTP_{t-1}$  on  $WTP_{t+1}$ , Conditional on Habitual Level of Consumption.

signification. In turn, adjusted R-squared value shown that model 6 explains a 33.1% of variability, improving significantly up to a 0.014 model 5.

In conclusion, the results affirm a S-shaped moderated effect of HLC over the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ . Besides,  $WTP_{t-1}$  explains  $WTP_{t+1}$  not only directly but also indirectly through  $WTP_t$ . In the next section we calculate, on the basis of model 6, the direction of this moderated mediation effect and its significance at different values of HLC (low, moderate, and high). Model 6 is chosen because it is the model with highest explanatory power.

#### 4.2. Conditional effects of habitual level of consumption on the influence of $WTP_{t-1}$ on $WTP_{t+1}$

We begin with the following equations, formed with the values of Model 6 from Table III and Model 1 from Table IV, which reflect the moderated effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  and the effect of  $WTP_t$  on  $WTP_{t+1}$ :

$$\widehat{WTP}_{t+1} = 0.353*WTP_{t-1} + 0.069*HLC - 0.047*HLC^2 - 0.001*HLC^3 + 0.064*WTP_{t-1}*HLC + 0.050*WTP_{t-1}*HLC^2 - 0.143*WTP_{t-1}*HLC^3 + 0.252*WTP_t \tag{1}$$

$$\widehat{WTP}_t = 0.861*WTP_{t-1} \tag{2}$$

To derive a graphical interpretation (Fig. 3), we estimate the conditional effect of the HLC on the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$ . As a result, the effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  becomes a function that depends on the HLC, with the proposed mediator remaining constant (Hayes, 2018, p. 449). The resulting expression is:

$$\theta_{WTP_{t-1} \rightarrow WTP_{t+1}} = -0.143*HLC^3 + 0.050*HLC^2 + 0.065*HLC + 0.353 \tag{3}$$

In addition, we determine the direct effect of  $WTP_{t-1}$  on  $WTP_t$  by

calculating the derivative of the previous expression in relation to  $WTP_{t-1}$ . To obtain the indirect effect of  $WTP_{t-1}$  on  $WTP_{t+1}$  through  $WTP_t$ , we multiply the components that define the indirect effect (Hayes, 2018, p. 448). The components are the effect of  $WTP_{t-1}$  on  $WTP_t$  and of  $WTP_t$  on  $WTP_{t+1}$ :

$$\theta_{WTP_{t-1} \rightarrow WTP_{t+1}} = 0.861*0.252 \tag{4}$$

Using a “pick-a-point approach,” in Fig. 4 we present the effects of  $WTP_{t-1}$  on  $WTP_{t+1}$ , conditional on a range of values of the mean-centered HLC—low (−1.77, 16th percentile), moderate (0.23, 60th percentile), and high (1.23, 84th percentile)—and its signification (Table VI), which corresponds to our range of interest. We chose these values according to the way  $WTP_{t+1}$  is distributed in our sample (Hayes, 2018, p. 450).

To illustrate the influence of  $WTP_{t-1}$  on  $WTP_{t+1}$  according to the HLC, we calculate the tangent of Eq. 3 at the different points that represent the range of interest (HLC = −1.77, 0.23, and 1.23, Eq. 5) (Brown, 2014, p. 250). The values of the HLC that shapes the slopes appear in Table VII and are represented in Fig. 4.

$$f\theta_{WTP_{t-1} \rightarrow WTP_{t+1}} = -0.429*HLC^2 + 0.100*HLC + 0.065 \tag{5}$$

Consistent with H4, the results show a positive and significant effect of the relationship between WTP in the two periods of consumption ( $WTP_{t-1} \rightarrow WTP_{t+1}$ ) when the HLC is moderate (HLC = 0.23  $p < .001$ ). Conversely, a negative and significant effect occurs when the HLC is high (HLC = 1.23,  $p < .01$ ) and when it is low (HLC = −1.77,  $p < .01$ ) (Table VII). These results support H4a–H4c; the shape of the moderation relationship is as predicted.

## 5. Conclusions

This study advances extant literature on revenue management and pricing. We empirically demonstrate that WTP changes between consumption periods according to the customer’s HLC in a context of repeat and hedonic purchases.

Regarding revenue management, we empirically argue that there is a relationship of WTP between two purchases. In this way, we not only show the direct effect of  $WTP_{t-1}$  over  $WTP_{t+1}$ , but  $WTP_{t+1}$  is also indirectly influenced through  $WTP_t$ . Which is consistent with the idea, that the expectations of the pre-purchase ( $WTP_t$ ) are considered strongly to evaluate the overall tourism experience (Sánchez et al., 2006). Therefore, utility of a single purchase is formed in the pre-purchase period ( $WTP_t$ ) as well as after the consumption ( $WTP_{t+1}$ ).

Regarding tourism accommodation pricing, the results of this study show that, when proposing a price, revenue managers must take into consideration both the last experience with the service and the consumer’s habitual level of consumption. Past consumption influences current utility in different ways, and we offer an initial empirical application about how HLC influences WTP into a specific sector. Consumer’s purchase experiences are crucial to develop more informed dynamic pricing strategies on recurrent purchased products (Arslan and Kachani, 2011). This research incorporates previous WTP, as well as HLC, in a single model to evaluate current WTP, which offers a novel approach to develop dynamic pricing strategies.

This application reveals that WTP is dynamic in time and depends on familiarity or habit with a good in a similar way to the theoretical proposition of habit formation and satiation models. We thus identify a positive relationship in WTP between different purchases when the consumer is in a “sensitization” stage. However, this relationship becomes negative when the HLC is notably high (habituation) or low (satiation); in the latter case, we find the most intense magnitudes of change. The fact that WTP is greater at moderate HLC is consistent with (Dubra et al. (2019). They conclude mathematically that the optimal sequence of consumption over time must intercalate consumption of variety to maintain a moderate HLC and so, the interest on the preferred

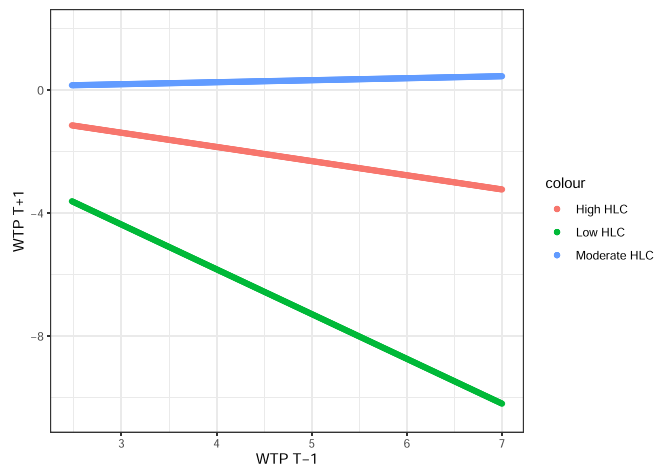


Fig. 4. Effect Slope from WTP<sub>t-1</sub> to WTP<sub>t+1</sub> at High, Low, and Moderate HLC Points.

Table VI  
Habituation Effect in the Relationship between WTP<sub>t-1</sub> and WTP<sub>t+1</sub>.

HLC	Indirect Effect	Direct Effect	Total Effect		
	Estimate	Estimate	Estimate	t	p-Value
Low (-1.77 → Nhc = 2 times)	.217	1.195	1.412	10.199	.000
Moderate (0.23 → Nhc = 4 times)	.217	.368	.585	4.147	.000
High (1.23 → Nhc = 5 times)	.217	.239	.456	2.573	.010

Significance level: \*\*\*p<.001; \*\*p<.01; \*p<.05.

choice; this consumption sequence maximizes total utility in a repetitive purchase context.

Due to control variables and the requirement of maintaining the accommodation type and category between consumption periods, the results are consistent and extrapolated for different types of accommodation (Hotel room, entire apartment, and private room in apartment), categories (1–5 stars or equivalent) and situations (destination, seasonality, and reservation method). As suggested in the literature, a higher accommodation category implies a higher willingness to pay. However, the use of logarithms and a perspective in which we compare the current willingness to pay against a repetitive purchase in which the category does not change, allows us to generalize these results. In addition, we can see how the increase or decrease in willingness to pay is relative (in percentage terms) against to the previous purchase.

When the HLC is low (-1.77; HLC = 2), the effect of WTP<sub>t-1</sub> on WTP<sub>t+1</sub> is -1.456. In percentage terms, a 10% increase in WTP<sub>t-1</sub> implies a 14.56% decrease in WTP<sub>t+1</sub>. Approximately coinciding with the average, when the HLC is moderate (0.23; HLC = 4), a 10% increase in WTP<sub>t-1</sub> represents a 0.64% increase in WTP<sub>t+1</sub>. Finally, when the HLC is high (1.23; HLC = 5), a 10% increase in WTP<sub>t-1</sub> implies a 4.62% decrease in WTP<sub>t+1</sub>.

These conclusions advance in pricing literature, especially regarding reference prices and consumers value segmentation models, as Recency, Frequency and Monetary value model (RFM). It is concluded that a positive experience in the previous stay does not always translate into an increase in current utility, which explain why even satisfied consumers, frequently do not come back due to satiation or excessive habituation (Jang and Feng, 2007; Sánchez-García et al., 2012). In conditions where

Table VII  
Effect of WTP<sub>t-1</sub> on WTP<sub>t+1</sub> According to Low, Moderate, and High Values of HLC.

	f(-1.77)	f(0.23)	f(1.23)
$f\theta_{WTP_{t-1} \rightarrow WTP_{t+1}}$	-1.456	.065	-.462

no moderator is considered, reference price literature posits a positive relationship between the reference price (WTP<sub>t-1</sub>) and current WTP (WTP<sub>t+1</sub>). However, when a consumer feels satiation or habituation, current stay is not perceived as pleasant as in previous occasions, which translates into a lower WTP. This behavior is also opposite to RFM model conclusions, which argues that frequency and recency (less time between consumption) influences positively the value that the company attributes to a consumer. However, this model does not explicitly consider the consumer’s utility perception regarding the product or service, that we demonstrate that decrease with consumption frequency. We think this model should consider consumer’s perceived value, since seems contradictory to attribute a high value for the company to a consumer whose WTP decay over time.

These results open lines of research that we understand are important both from an academic and managerial perspective.

First, the consideration of satiation as a complementary to HLCs measure for explaining WTP in repetitive purchase context. The effect of satiation is implicitly manifested in WTP, but its effect as a control variable is not significant. This variable might have a stronger influence in other circumstances, such as with low HLC; it would be interesting to study satiation as a moderator by itself, in line with evidence that it can explain variety seeking behaviors (Park and Jang, 2014; Sevilla et al., 2019).

Second, it is necessary to check whether the results are similar in the case of three important purchasing contexts: (a) contrast the results with those obtained in a segment as important as consumers over 65 (our sample is limited to < 65), because the effect of retirement may represent a change not only in their travel frequency, but also in the weight they attribute to their past use experience (Losada et al., 2016). (b) consider different booking advance (in our sample was around 25 days), thus advance can influence the type of information that is considered when forming WTP. (c) compare the effect of the higher or lower accommodation cost because price sensitivity might change between accommodation categories.

Third, literature suggest that hedonic decline is different between products (Galak and Redden, 2018), so the generalization of the results to other services and products would depend on the result of a multi-categorical research comparing utilitarian vs hedonic (Park and Jang, 2014), high involvement vs low involvement (Chen and Liao, 2019) or risky vs no-risky purchases (Casidy and Wymer, 2016).

Fourth, despite suggesting that previous stays experience influence over current WTP is weaker among habituated customers, we cannot confirm which are the key variables that explains their WTP and, therefore the purchase decision. The influence of relationship marketing variables (satisfaction, loyalty, perceived quality) on WTP behave differently in conditions of high vs low perceived risk (Casidy and Wymer, 2016). Based on this evidence, the inclusion of HLC on this relationship could shed additional light about the key variables considered by the different consumers’ segments on recurrent use services’ purchase decision.

## 6. Managerial Implications

The restriction of supply in the short term, transience of the service, temporality, and high competition make optimizing the value captured from customers in each new purchase essential in this sector.

We recommend revenue managers recording the consumers’ prices paid, previous stay experience, WTP, and consumption frequency

throughout a customer's life cycle. In this way, they can define consumer segments according to their consumption frequency, a measure available in their databases which reflects consumers HLC with a service, while controlling also the other relevant variables.

This segmentation is useful to pricing and revenue management policies for two reasons:

First, to know which variables are relevant in consumers decision making. As it is shown, the experience of previous stay ( $WTP_{t-1}$ ) is an important reference to shape WTP when consumers consider a new purchase decision, however the strength and direction of the relationship between  $WTP_{t-1}$  and  $WTP_{t+1}$  depends on the HLC. In Table VI it is shown how the coefficient of the relationship changes regarding low, moderate, and high values of HLC. The results shows that this coefficient decreases as HLC increases. Consumers who have a high frequency of consumption (habituation) consider more weakly, compared to low or moderate HLC, the experience of previous stay as a reference on which to decide the purchase. It seems that all customers are aware of the price they have paid, but their current decision is explained by different variables.

Habituated customers are very likely to tend to be more objective in their decisions, since they have a greater user experience, which can make them more critical when comparing their past experiences with the current information available. They have a better knowledge of the product and therefore a greater ability to buy. So, in his decision, several variables beyond their most recent experience, may be considered. By contrast, sensitized consumers trust their past experiences as a reliable indicator of their expectation of future experience because they are not so expert customer, so the purchase decision fall to their stays' limited experiences. Trust their previous experiences is a facilitator of the new hire decision, thus maintaining a positive inertia in WTP's assessment.

In this sense, revenue managers must employ different communication and value offers. On the one hand, loyalty programs can enhance habituated customers' perceived benefit. On the other, reminding sensitized customers their previous positive experiences with the offered service or an augmented service offering, can determine the election of our accommodation against cheaper alternatives, because it seems they are not as price-sensitive as habituated customers.

Second, HLC segmentation is important to achieve a high-value customer portfolio with a longer life cycle. Contrary to RFM model, we posit that a more frequent customers do not always translate in higher WTP, and thus incomes could be undermined (Dubra et al., 2019). WTP of habituated consumers decay over the consumption life-cycle. However, sensitized one are willing to pay an extra in next purchases. We suggest that providers can capture more value in this segment by setting the price close to the maximum WTP over each consumption. In turn, we advise managers to balance their customer portfolio between habituated and sensitized customers.

Sensitized customer acquisition cost may be higher, compared to habituated, because they will consider as first option their previous accommodation, and seems reluctance to change, however his higher WTP over consumption periods can balance this overrun. Finally, consumers with a low HLC are less attractive. Their WTP will decline with their next consumption, and they are likely to look for alternatives (Sevilla et al., 2019).

Tourism providers should use this insight to improve their resource allocation decisions: They should invest more in attracting new customers with moderately HLC (sensitization), who likely will increase their WTP through the consumption life-cycle. While also investing in retaining to those with high HLC by enhancing their perceived benefit, because it will decay over time.

To sum up the conclusions and implications, in this research we analyze through HLC the importance of consumer behavior's pricing discrimination. We provide concrete evidence about variations in price that a company should consider, based on the consumption patterns of each customer, and we propose a way to segment consumers based on their consumption frequencies.

## Funding details

This work was supported by European Social Fund (European Union), Grant Number: Order December 21, 2019 from Junta Castilla y León; Ministerio de Ciencia e Innovación (Spain), Grant Number: PID2020-113469GB-I00; Consejería de Educación, Junta de Castilla y León (Spain), Grant Number: CLU-2019-03; Consejería de educación JCYL - European Development Regional Fund (Spain), Grant Number: Order may 5, 2020 - SA106P20

## Data Availability

Data will be made available on request.

## Appendix A. Supporting information

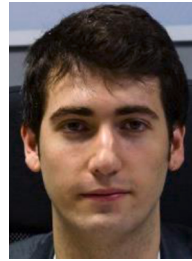
Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.ijhm.2022.103210](https://doi.org/10.1016/j.ijhm.2022.103210).

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