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Hotel satisfaction and booking channels: The Bayesian rule and regression analysis

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HOTEL SATISFACTION AND BOOKING CHANNELS: THE BAYESIAN RULE
AND REGRESSION ANALYSIS

by

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Bachelor of Art
Southern Utah University, Cedar City
2003

A thesis submitted in partial fulfillment
of the requirements for the

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ABSTRACT

Hotel Satisfaction and Booking Channels: The Bayesian Rule and Regression Analysis

by

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The study utilizes the Bayesian mechanism and calculates the likelihood for each of the booking channels in the study to supply to lodging operations UNLV students who will become highly satisfied with the subsequent hotel stays. Hospitality proprietary booking channels (booking by phone or booking through a hotel's own web site) are more likely to supply a highly satisfied student traveler to an operation than intermediary booking channels, such as booking through a merchant site or addressing a travel agent.

Moreover, UNLV students who utilize hospitality proprietary channels tend to bring higher room revenue to a lodging operation than the students who book through intermediary channels. At the 0.05 significance level, UNLV students' overall satisfaction with booking experiences is the only factor related to experiences with booking channels to influence respondents' satisfaction with the subsequent hotel stays.

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CHAPTER 1

INTRODUCTION

Purpose of the Study

In the contemporary business environment, hospitality consumers have the freedom of choosing among many booking channels or methods of making hotel reservations (Burns & Inge, 2004). With the development of the Internet, self-serving and decentralized channels (hospitality proprietary web sites and third-party web sites) have gained popularity. More traditional ways of booking, such as utilizing travel agents or calling a hotel directly also remain in use (Miller, 2004; Green, 2005). Previously conducted research on hospitality booking established that experiences with booking channels might contribute to consumer satisfaction with the subsequent hotel stays (Jeong & Choi, 2004; Thompson, 2005).

The proposed study utilized the Bayesian approach to data analysis and calculated probabilities for various distribution channels to supply to a hospitality operation a guest who would become highly satisfied with his/her hotel stay. To investigate the factors of experiences with booking channels that are more likely to influence consumer satisfaction with the subsequent hotel stays, the study further regressed consumer perceptions of being satisfied with the hotels stays against their perceptions of factors related to experiences with booking channels. The data for the Bayesian calculations and regression analysis were gathered through a survey of UNLV students who had recently

traveled and stayed in a hotel. During the survey, the respondents were asked about their choices of booking channels, levels of satisfaction with booking experiences, and levels of satisfaction with the subsequent hotel stays.

Significance of the Study

The proposed study was concerned with utilizing the Bayesian approach to data analysis to infer probabilities for hospitality distribution channels to bring to a hospitality operation a student traveler who would become highly satisfied with his/her hotel stay. The study had potential to contribute to the existing body of research in two areas: (a) In the area of applying the Bayesian methodology to facilitate decision making in the hospitality industry and (b) in the area of studying the college students' market segment in hospitality.

Fergusson and Selling (1985) proposed that, in hospitality, the Bayesian approach found the most efficient application in forecasting volume of business operations in the future. The proposed study's objective was to demonstrate how the Bayesian mechanism might be applied to reduce uncertainty of utilizing a distribution channel for a lodging operation. The study suggested that calculating a channel's probability to supply to an operation a student traveler who would be highly satisfied with his/her hotel stay might provide an insight on a channel's overall propensity to supply highly satisfied guests to an operation.

To assign prior probabilities for the Bayesian mechanism, the proposed study analyzed the data gathered through a survey of UNLV students. In a hotel setting, an analogous Bayesian mechanism may be utilized to calculate the posterior likelihood for a

booking channel to produce a highly satisfied guest for the operation. When the proposed Bayesian approach is applied by a lodging operation, the prior probability for a guest to select a booking channel may be assigned from the information provided by the hotel's registration system. To find out about the levels of guest satisfaction within the hotel, a short survey might be conducted at checkouts.

Because the study surveyed the UNLV students, the information obtained about the respondents' behaviors relative to booking accommodations may also contribute to the body of research of the college students' traveling behaviors. With relation to studying the college students' market segment, the study intended to find out whether the demographic characteristics of genders and cultural origins that are known to influence students' traveling behaviors would also affect students' choices of hospitality booking channels (Field, 1999; Shoham, Schrage, & Eeden, 2004). The study suggested that, although college students represent a narrow segment of today's hospitality market, studying college students' behaviors can be potentially beneficial because today's college students will become important players on the market of the future as business travelers or high paying leisure travelers (Shoham et al., 2004).

Definition of Terms

The study operated specific terms relative to the Bayesian mechanism and distribution channels in hospitality.

The Bayesian Terminology

1. The Bayesian approach to data analysis that is also known as the Bayesian mechanism, rule, or theorem, refers to the process of making probabilistic

statements about unknown distributions of parameters when prior probabilities of the parameters and the events studied under the parameters are obtained from observations (Rossi, Allenby, & McCulloch, 2005).

2. From the Bayesian standpoint, a statistical frequency of an event equals probability for the event to occur (Yudkovsky, 2003). The terms frequencies, densities, or distributions may be used interchangeably (Retzer, 2006).
3. Prior probabilities or priors are assigned from observations, surveys' data, or databases (Rossi et al., 2005). Posterior probabilities are calculated through applying the Bayesian rule.
4. Conditional probabilities are functions of the type $P(A/X)$, which are also called likelihoods (Retzer, 2006).
5. Likelihoodism refers to the practice of assigning prior conditional probabilities, which would be inconsistent with "systematized intuitions about examples" and utilizing the Bayesian mechanism to back implausible theories (Sober, 2002, p. 26).

Terminology with Relation to Hospitality

Distribution Channels

1. Hospitality distribution channels or booking channels are methods available to consumers for reserving accommodations (Burns & Inge, 2004). The literature distinguishes centralized booking channels and decentralized, self-serving channels (Green, 2005).
2. Booking through a centralized channel occurs when customers rely on expertise of a travel agent who makes reservations through one of the Global Distribution

Systems (Green, 2005).

3. Booking through a decentralized, self-serving channel occurs when customers make reservations by their own: call a hotel directly, utilize hospitality own sites, or merchant sites (Connolly, Olsen, & Moore, 1998).
4. Third-party web sites, that are also called merchant sites or intermediary sites, include popular web sites, such as Travelocity, Expedia, Orbitz, Hotels.com, and others that distribute at a discounted rate the hospitality inventory allocated to them by various hotel operators (Miller, 2004).
5. Hospitality own web sites or proprietary sites are web sites, through which individual properties or hotel chains distribute their own inventories. Own web sites include booking tools that allow customers to reserve a room after checking daily rates and availabilities (Miller, 2004).

Limitations of the Study

The potential limitations of the study stemmed from the specific character of the surveyed population and a limited scope. The study surveyed UNLV students who had recently traveled and stayed in a hotel. The study intended to analyze the obtained data and examine the event of student's high satisfaction with the hotel stays under the parameters of the booking channels that the respondents utilized to reserve accommodations. The study also intended to observe: (a) How the respondents had searched for hospitality information, (b) what motivated them to select a hospitality booking channels, (c) and how much they paid for a room/night in a hotel.

The previous studies on the college students' market segment maintained that the

college students' population was not homogenous. Students' travel habits would vary across universities and demographic groups inside a university's population (Field, 1999; Shoham et al., 2004). Thus, the proposed study expected that the traveling behaviors observed through surveying UNLV students would be specific for the population of this particular university, while students of other universities may differ from UNLV students in the ways of searching for hospitality information, choosing traveling destinations, selecting hospitality booking channels, as well as assessing their satisfaction with booking experiences and experiences within hotels.

The scope of research also imposed limitations on the design of the study. The study was designed to examine only one attribute of customer loyalty in hospitality – consumer satisfaction with the hotel stays. Söderlund and Ohman (2005) argued that satisfaction with on-property services represented emotional aspect of hospitality loyalty, while the behavioral aspect of loyalty was associated with customers' intentions to re-patronize an operation. Furthermore, some hospitality theorists distinguished between re-patronizing behaviors that were due to loyalty and re-patronizing behaviors that occurred as a result of behavioral inertia (Alegre & Cladera, 2006).

The proposed study chose to concentrate on the emotional aspect of hospitality loyalty (consumer satisfaction with the hotel stays) and did not attempt to examine the behavioral aspect of loyalty because of the complexity of factors that are known to cause re-patronizing behaviors (Alegre & Cladera, 2006). More research would be needed to examine booking channels' potentials to influence customer propensity to re-patronize a lodging operation, and conclude about whether booking channels might significantly contribute to building loyalty of hospitality consumers.

CHAPTER 2

LITERATURE REVIEW

Literature on the Bayesian Approach in Business

The Bayesian mechanism was developed by the Reverent Thomas Bayes, a Presbyterian minister, who lived in Britain in 1702-1761 (Barnard, 2002; Yudkowsky, 2003). Bayes's work on probabilistic inference remained unknown during the author's lifetime. In 1763, Richard Price, one of Bayes' close friends and heirs, presented the Bayes' paper *An Essay Towards Solving a Problem in the Doctrine of Chances* to the Royal Society of London (Barnard, 2002). The scientific community became largely familiar with the Bayes's theorem through later works of the famous mathematician Pierre-Simon Laplace, who developed a model for predicting future events, also known as Laplacian superintelligence (Yudkowsky, 2003). In the modern period, the significance of Bayes's contribution to the probability theory was first recognized in the 1908 Cantor's treaty on the history of mathematics (Barnard, 2002).

In the modern business setting, the Bayesian mechanism finds applications in corporate finance analysis (Van Gestel, Baesens, & Suykens, 2006), hospitality (Ferguson & Selling, 1985), marketing (Deal, 2006; Kumar, Venkatesan, & Rejnartz, 2006; Retzer, 2006), and procurement (Sen, 2000.) Business applications favor three Bayesian approaches: the Hierarchical Bayesian approach (the HB approach), the Bayesian model updating approach, and the Bayesian model averaging approach (the

BMA approach) (Retzer, 2006). The Hierarchical Bayesian approach (the HB approach) is associated with discrete choice conjoint analysis, which reflects the process of consumer differentiation between various types of products and allows estimating products' utility on an individual basis, rather than calculating an average utility for a consumer sample.

The Bayesian model updating approach is a mechanism that helps to update predictive models by incorporating new information. Under the Bayesian updated model approach, the posterior probabilities, which were calculated for a previously collected set of data, are utilized as priors for estimating parameters of an upcoming period. The Bayesian model averaging approach (the BMA approach) constitutes an alternative to a traditional regression procedure to estimate weights of variables in a predictive model. The BMA approach represents model optimization process through eliminating variables with the lowest weights (Retzer, 2006).

The Bayesian Approach in Marketing

In marketing, the HB approach (the Hierarchical Bayesian approach) is mostly associated with discrete choice analysis. Under the HB approach, the Bayesian mechanism may be applied to data acquired from a point of sales to estimate probabilities of purchases when a product is available in different pack-sizes and quantity discounts are also provided (Deal, 2006). Kumar et al. (2006) apply the HB mechanism to a case when the priors are assigned from a CRM database of customer purchases to predict likelihood of a particular sale to occur in a particular time. For a retailer, the HB approach provides insights on the clients' future behaviors and helps to target a direct-mail campaign more precisely.

The Kumar's et al. (2006) paper compares two tri-dimensional predictive models, the traditional and the Bayesian, that are built to estimate, which customer is more likely to purchase which product and at what time. The traditional model utilizes the regression technique, which is applied to a range of variables relative to customer decision-making, while the second model is based on the HB mechanism. Comparing the experimental data reflecting actual purchases made by a group of customers over a year to the predictions obtained from both of the examined models demonstrates that the HB approach increases likelihood of obtaining an accurate prediction by about 85%.

The HB mechanism does not imply calculating regression coefficients and, thus, eliminates sample error. From the practical standpoint, a more accurate prediction of purchases allows for reducing the volume of offers directed to a particular customer, which improves relationship with customers and reduces marketing expense (Kumar et al., 2006). However, Kumar et al. emphasizes that a Bayesian model predicts consumer behaviors efficiently when it utilizes relevant parameters and assigns the prior conditional probabilities that accurately describe behavioral patterns inside the examined population.

The Bayesian Approach in Finance

In corporate finance analysis and credit management, Van Gestel et al. (2006) utilizes the BMA approach (the Bayesian model averaging approach) to infer about posterior probabilities of bankruptcies for corporate loan applicants when prior probabilities are assigned from financial statements. The Van Gestel's et al. initial model for predicting a corporate financial distress comprises 40 variables representing financial ratios and trends of ratios. The BMA approach is used to calculate the most influential input variables to

be utilized in an optimized model based on four ratios: (a) Solvency, (b) percentage of total assets, (c) total assets return on equity, and (d) assets turnover. As compared to the traditional bankruptcy studies, liquidity ratios appear to be less crucial for the Van Gestel's optimized model.

The optimized model allows computing posterior probabilities of financial distress that a financial institution may utilize to evaluate creditworthiness of a loan applicant and identify doubtful cases that would require in-depth investigation. The study emphasizes that the BMA approach provides more accurate results than the traditional ratio analysis or linear statistical modeling (Van Gestel et al., 2006). To conclude the study, Van Gestel et al. tests the BMA model for predicting bankruptcies of medium range enterprises in Benelux and compares the Bayesian prediction to the bankruptcy data on records. The bankruptcy data on records are also compared to predictions obtained through linear regression analysis. The Van Gestel's study's conclusion postulates that the BMA prediction of bankruptcies of medium range enterprises in Benelux was more exact.

The Bayesian Approach in Procurement

In procurement, the Bayesian methodology applies to the supply and demand analysis with a goal to optimize inventory decisions. Since 1959, a so-called Bayesian demand learning has been incorporated in the models relevant to procurement and price allocation in the retail industries, such as fashion, textile, and apparel industries, that deal with selling perishable items over a limited period of demand (Sen, 2000). In fashion and apparel retail, the Bayesian model updating approach is used to predict future sales from the sales of a previous period and update an initial predictive model by incorporating information about sales obtained at the beginning of a new season.

In the model, prior probabilities of demand and customers' sensitivity to price are assigned from the data available through point of sales scanning. The Bayesian approach is used to reduce uncertainty relevant to demand (Sen, 2000). Although Sen observes that airlines and the hospitality industry pioneered the methodology of forecasting demand to develop pricing policies for an upcoming season, Sen also notices that the Bayesian approach has found only a limited application in hospitality.

The Bayesian Approach in Hospitality

In hospitality, Fergusson and Selling (1985) develop a practical application for predicting financial results for restaurants and lodging operations under the parameters of understaffing and overstaffing. To initiate the Bayesian mechanism, a manager may utilize the information available from a prior sales period or season to assign priors to a low volume of business and to a high volume of business. In the process of preparation for a future event or season, when new information becomes available (for instance, weather forecasts) priors may be updated using the Bayesian rule. The approach developed by Fergusson and Selling (1985) may be used in estimating payoffs for restaurants and incremental revenues for lodging operations to reduce uncertainty associated with future levels of business.

To estimate payoffs and losses if understaffing or overstaffing occurs, the probability calculated for a high volume of operations and for a low volume of operations is multiplied by the expected revenue. Based on the model, the biggest expected loss is associated with overstaffing under low sales. If understaffing occurs under low sales, it will be no gain, but also no loss. If business volume is high, there is a high likelihood of gain under overstaffing, but it is also likely that it will be no loss under understaffing.

According to Fergusson and Selling (1985), the reliability of Bayesian calculations for problem solving in hospitality depends on an accurate estimation of prior probabilities and a managerial ability to determine logical relationship between past and future events. For instance, in hospitality, future volume of sales may be successfully predicted from the number of reservations made ahead of time. According to Fergusson and Selling, in the hospitality industry, the Bayesian approach finds the most efficient application in forecasting volume of business in the future. In the current period, a great deal of uncertainty in the hospitality industry is associated with inventory distribution that may occur via various distribution channels (Green, 2005). The proposed study argues that the Bayesian mechanism may reduce uncertainty of using a distribution channel for an hotelier.

Literature on Consumers' Booking Behaviors

Booking Channels and Consumer Loyalty to Hospitality Brands

In the early 1990's, with the growing popularity of Internet, four new trends immersed in consumer demand relative to hospitality distribution: (a) Concerns about time saving, (b) concerns about getting more value for customers' money, (c) demand for self-service, and (d) customers' desire to be treated as individuals, rather than being viewed as mass market (Connolly, Olsen, & Moore, 1998). By the year 2000, the technological advance created enough hospitality channels of distribution to provide an adequate medium for any of the new trends in consumer demand (O'Connor & Frew, 2002). Burns and Inge (2004) identified five main channels, or methods available to consumers for checking hospitality availabilities and making reservations: (a) Calling a

hotel's front desk or brand's reservation center, (b) using own hotels' web sites and brands' web sites available on the Internet, (c) using third party web sites on the Internet, (d) recurring to travel agents, who may operate through the Global Distribution System or an Internet based distribution system, (e) recurring to meeting-planning agents.

To take advantage of new booking opportunities, hospitality consumers increasingly began to utilize self-serving or so-called decentralized booking channels (Green, 2005). De-centralization referred to the consumer desire of checking accommodation options personally, via Internet or by calling a property directly, rather than seeking assistance of a travel agent (Green). Self-serving consumers often combined booking channels while shopping for accommodations ("Leisure travelers," 2005). According to *Travel Agent*, 59% of leisure travelers had checked prices online prior to making a direct call to a reservation desk ("Leisure travelers").

At the beginning of online distribution, booking through third party web sites prevailed over utilizing hospitality own channels (Green, 2005; Miller, 2004). Furthermore, Green noticed that online booking merchants tended to centralize their business. Consolidation of the third party online distribution facilitated creation of the booking brands, such as Travelocity and Expedia, which began to compete in visibility with the leading hospitality brands, such as Marriott, Holiday Inn, and Hilton (Churchill, 2005). Characteristically, customer orientation toward booking through online merchants did not produce loyalty to hospitality operations or enhance hospitality brands' value (Churchill, 2005; Miller, 2004,). The following section addresses factors of consumer experiences with booking channels that might have been relevant to building consumer relationship with hospitality brands and operations.

Preference for Low Daily Rates

One of the factors responsible for consumer satisfaction with booking channels and satisfaction with the subsequent hotel stays was consumer perception of having booked a room at a low rate (Thompson, 2005). In 2002, The HSMAI Foundation's (the Hospitality Sales and Marketing Association International Foundation's) analysis of hospitality consumer satisfaction named the perception of booking at a low daily rate being the leading criterion for consumer choices of accommodation at the beginning of the century (Watkins, 2003). Consumer desire to find low rates also influenced consumer satisfaction with booking channels and determined consumer preferences for booking through third-party sites that allowed for comparing daily rates across properties and offered discounted accommodations (Miller, 2004; Thompson, 2005).

Perceptions of having booked a room at a low rate were equally relevant for 15.1% of leisure and business travelers (Watkins, 2003). To restore consumer loyalty to hospitality brands, Miller (2004) and Thompson (2005) urged hoteliers to implement the so-called tactic of the best price guarantees that would ascertain parity of prices across booking channels and help to overcome perceptions of the third-party sites as being the channels that would offer the lowest booking rates.

Need for Ascertaining Room Availability

In 2005, hospitality occupancy and average daily rates began to increase along with an increase in travel volume ("Seller's Market," 2005). The Pricewaterhouse report showed that in 2005 the occupancy was 63.4%, which represented a 2% increase as compared to 2004 or the biggest occupancy yearly growth since 1977 ("Seller's Market"). According to the same source, in 2005, the average daily rate was \$ 89.97,

which represented a 4.3% increase as compared to 2004 (“Seller’s Market”). Hospitality executives argued that the increased occupancy and average daily rate were the factors that helped to reinforce market position of the leading hospitality brands over the leading third party distributors (Churchill, 2005).

Churchill (2005) also maintained that while looking for accommodations, customers began to turn toward hospitality own channels of distribution, such as reservation desks, call centers, and hotels’ own web sites or brands’ web sites. Thompson (2005) attributed the success of hospitality own booking channels to the customer perception that making reservations through own web sites or calling front desks directly ensured room availability upon arrivals to a hotel under an increased occupancy. Jeong and Choi (2004) argued that a well maintained proprietary channel provided reliable and satisfying information to consumers about their future stays in a hotel, improved communication with customers, created favorable dispositions toward hospitality operations, and generated re-patronizing behaviors.

In 2005, hospitality operators concerned about optimizing consumers’ booking experiences increasingly began to allocate inventory to the proprietary distribution channels (“Hotels’ web sites,” 2005). Intercontinental that marketed 535,000 rooms daily, refused to allocate the inventory to Expedia, and made the decision to market the inventory through the company’s own channels (“IHG boosts,” 2005). Since then, the proportion of booking through the Group’s own sites had grown by 7% and had become responsible for 81% of online reservations (“IHG boosts,” 2005). Professional sources also observed that in 2005, with an increase in volume of hospitality operations, consumer satisfaction with hotel stays has also increased (“J.D. Power study,” 2005).

The North America Hotel Guest Satisfaction Index Study based on surveying of 37,471 hotel guests in 2005 reported growing customer satisfaction with hotel services (“J. D. Power study,” 2005). To find out which factors of booking experiences might have influenced consumers’ satisfaction with the hotel stays along with an increase with services provided on property, the study regressed the respondents’ satisfaction with hotel stays against: (a) Their overall perceptions of being satisfied with a booking channel, (b) their perceptions that the chosen booking channels would ascertain room availabilities upon arrivals to a hotel, and (c) their perceptions of being offered a fair booking rate across channels. To discover whether the college students would possess specific booking behaviors the study reviewed the literature on the college students’ segment of hospitality market.

Literature on the College Students’ Segment of Hospitality Market

Students represent a narrow segment of today’s hospitality market, but they will become important players on the market of the future as business travelers or high paying leisure travelers (Shoham, Schrage, & Eeden, 2004). The reviewed studies on the college students’ segment of the hospitality market maintained that the college students’ population was not homogenous. Students’ travel habits would vary across universities and demographic groups inside a university’s population (Shoham et al.). The literature also maintained that demographic factors of genders, cultural origins, and travel destinations were likely to influence behaviors of the traveling students (Field, 1999; Shoham et al., 2004).

Cross-cultural studies of international and American students' behaviors noticed that students usually avoid going on cruises (Field, 1999; Shoham et al., 2004). Shoham's et al. study on students' general traveling habits advanced that students preferred traveling during summer breaks and their favorite activities were cultural in nature. At the same time Field, who studied students' traveling habits during spring breaks, found that foreign students would prefer touring cities and sightseeing, while American students would rather go to a beach. According to Field (1999), American students would favor road trips, while foreign students would fly to their destinations. Although both groups would most commonly stay in hotels, some domestic students would also stay in hostels or private houses (Field).

Field (1999) also found that although American students were more likely to travel during spring breaks than international students, the subgroup with the highest likelihood to travel would be single female students. Female students would utilize travel agents more than male students and also would be more willing to spend on shopping. Although students' choices of travel destinations would depend upon a university's location, during spring breaks, the American students were more likely to travel to a sea resort in Florida or Mexico (Bai, Hu, & Countryman, 2004).

The population of the UNLV students was previously studied as a sub sample of the Bai's et al. (2004) study, which addressed students of three large urban universities. The Bai's et al. study proposed that the Internet was the most efficient way of communicating with the college students' market segment because 14% of students reported purchasing vacations exclusively online. The study asked 60 hospitality students to perform vacation planning through one of the merchant sites and answer a questionnaire about their

planning experiences. The study concluded that the students were mostly satisfied with their online vacation planning through a merchant site (Bai et al.).

According to the study (Bai et al., 2004), levels of students' satisfaction with merchant web sites positively correlated with: (a) Availabilities of low priced packages through a site (the most significant factor), (b) students' sufficient experiences with online activities (the most satisfied respondents reported having utilized the Internet for more than four years), (c) students' familiarities with online purchases, and (d) students' perceptions of security about using credit cards online. The factor that negatively correlated with levels of students' satisfaction with merchant sites was the amount of time spent online before finding a package that would meet the respondents' search criteria. Among other online merchants, the majority of the respondents indicated preferences for Expedia (Bai et al.).

Because the Bai's et al. (2004) study utilized the sample from a similar population, it may be expected that the proposed study would also find that the UNLV students who would report utilizing online merchant sites would feel satisfied with their channels because merchant sites are known to provide fair deals across channels (Miller, 2004; Thompson, 2005). However, because of the new tendencies in hospitality consumers' behaviors relative to distribution channels, the most informed students, who are aware of the policy of low price guarantees, might also indicate preferences for booking through hospitality own sites. Because the Bai's et al. (2004) study found that not all the students are comfortable with e-commerce, it may be also expected that some students in the proposed study would indicate preferences for offline booking channels.

CHAPTER 3

METHODOLOGY

The Bayesian Mechanism

Yudkowsky (2003) formulates the Bayesian mechanism as Equation 1 below:

$$P(A/X) = \frac{P(A) * P(X/A)}{P(A) * P(X/A) + P(\sim A) * P(X/\sim A)} \quad (1)$$

According to the Yudkowsky's (2003) interpretation, the left side of Equation 1 represents the logical inference of the posterior probabilities of parameter A given that event X was observed in reality (Retzer, 2006). $P(A/X)$ is also called the likelihood function of parameter A (Rossi, Allenby, & McCulloch, 2005). The right side of Equation 1 denotes the calculation to obtain the likelihood of parameter A. Thus, the Bayesian mechanism reflects reasoning that links observations from reality to a logical inference (Yudkowsky, 2003). For the purpose of the proposed study, priors were assigned from the frequencies of data obtained through surveying UNLV students.

In the upper bar of the right side of Equation 1, the probabilities $P(A)$ and $P(X/A)$ reflect observations from reality and are called priors. $P(A)$ equals the frequency of observing parameter A, which is also called the probability of observing parameter A in a sample. $P(X/A)$ equals the likelihood of observing event X given that parameter A is also observed. $P(X/A)$ also denotes the conditional probability of event X to occur under

parameter A. Formula $P(A) * P(X/A)$ represents the density of event X and parameter A to be observed simultaneously in the examined sample, which also may be expressed as $P(X \cap A)$, the joint probability of observing A and X in the sample together (Retzer, 2006). In the lower bar of the right side of Equation 1, the quantity $P(A) * P(X/A)$ denotes the density of event X under parameter A.

The quantity $P(\sim A) * P(X/\sim A)$ expresses the density of event X observed under a parameter, which is not A, when the condition $P(\sim A) = 1 - P(A)$ is also satisfied (Yudkowsky, 2003). The quantity $P(A) * P(X/A) + P(\sim A) * P(X/\sim A)$ represents the probability to observe X in the sample under all the possible parameters or conditions. The quantity $P(A) * P(X/A) + P(\sim A) * P(X/\sim A)$ can also be expressed as $P(X)$, the probability of event X to occur in the sample (Retzer, 2006). Therefore, Equation 2 below can also express the Bayesian theorem:

$$P(A/X) = \frac{P(X \cap A)}{P(X)} \quad (2)$$

To initiate the Bayesian mechanism, the proposed study assigned two types of priors: (a) $P(\text{Channel})$, which are the probabilities for a respondent to reserve a room through a booking channel in the study, and (b) $P(\text{HSR}/\text{Channel})$, which are the prior conditional probabilities for a respondent to become highly satisfied (HSR) with his/her hotel stay given that he/she had reserved a room through a particular booking channel. To calculate posterior likelihoods of the type $P(\text{Channel}/\text{HSR})$ the study utilized Equation 3:

$$P(\text{Channel}/\text{HSR}) = \frac{P(\text{HSR} \cap \text{Channel})}{P(\text{HSR})} \quad (3)$$

Survey Design

March 03, 2006, the UNLV Social/Behavioral Institutional Review Board approved the study to be conducted on the UNLV campus (Protocol # 0602-1882). The survey was administered during April and May, 2006 at the public areas in between the former Student Union Building, Frank and Estella Beam Hall, and Flora Dungan Humanities Building, as well as in the areas adjacent to Lied Library and the Classroom Building Complex. The questionnaires were printed out and randomly distributed to the respondents along with the Informed Consent forms also approved by the IRB. Only the students who reported that they had gone on a trip recently and had stayed in a hotel were asked to fill out the questionnaires. On average, a respondent needed about 5 minutes to mark the answers on a questionnaire. The interviewer obtained 200 valid responses. A response was considered valid if a respondent would indicate the booking channel that he/she had utilized and his/her level of satisfaction with the subsequent hotel stay. The collected data were analyzed using SPSS 12.0 software package.

The Questionnaire

The main section of the questionnaire consisted of eight questions addressing the issues of searching for hospitality information, reserving accommodations, feeling satisfied with the booking experiences and the subsequent hotel stays. The answers to the eight main questions constituted the variables used in the Bayesian calculations and regression analysis. Table 1 displays the questionnaire items and the correspondent variables.

Table 1

Questionnaire Items and Variables

Questionnaire item	What is measured?	Correspondent variable
	The parameters of the study	
1 How did you book your room?		The channels variable
	Satisfaction with the hotel stays	
2 Rate your satisfaction with your hotel stay.		The hotel satisfaction variable (Hotelsat)
	Differences across booking channels	
3 What sources did you use to collect hotel information?		The information search variable
4 Why did you choose this particular way of booking?		The choice motivators variable
5 What was your room rate?		The room rate variable
	Experiences with booking channels	
6 Rate your satisfaction with your booking experience.		The booking satisfaction variable (BS)
7 Do you feel that the hotel would honor your reservation upon arrival?		The room availability variable (RA)
8 Do you feel that you could have gotten a better deal if you had booked in another way?		The fair deal variable (FD)

Demographic Characteristics

The literature about the college students' market segment indicated that the characteristics of genders and cultural origins tended to influence traveling behaviors of the college students (Fields, 1999; Shoham, Schrage, & Eeden, 2004). To find out whether the factors of genders and cultural origins also influenced the respondents' choices of booking channels, the study calculated: (a) the gender variable, (b) the cultural origin variable. To create the gender variable: (a) Male students were coded with the number 1, (b) female students were coded with the number 2, and (c) missing values received the code of 0. To create the cultural origin variable: (a) The American respondents were coded with the number 1, (b) the respondents of foreign origins were coded with the number 2, and (c) missing values received the code of 0.

To find out about UNLV students' favorite traveling destinations the study also calculated the destination variable. To create the destination variable: (a) U.S. destinations outside of California, Florida, and Hawaii were coded with the number 1, (b) destinations to California, Florida, and Hawaii were coded with the number 2 (the study assumed that the students who traveled to California, Florida, and Hawaii traveled to resort destinations), (c) destinations abroad were coded with the number 3, and (d) missing values received the code of 0.

Variables of the Study

The Channels Variable

The answers to the question: “How did you book your room?” constituted the channels variable, one of the most important variables of the study. To address eight possible situations with booking, eight booking options were provided to the respondents: (a) Calling a hospitality reservation center, (b) calling a hotel directly, (c) booking through a hotel’s or a chain’s own site, (d) booking through a merchant site, (e) using a travel agent, (f) walking in without a reservation, (g) booking in another manner, and (i) not having participated in booking as a member of a group.

The respondents’ answers were collapsed in five categories of booking channels that corresponded to the types of booking channels identified by Burns and Inge (2004): (a) Phone booking that included the respondents who called a hotel directly and called a hospitality reservation center, (b) booking through hospitality own sites, (c) booking through merchant sites, (d) booking through agents, such as travel agents or connections in a hotel (agent booking), and (e) no advance booking, which included walk-ins and the members of traveling groups who did not participate in booking (no booking).

Frequency analysis of the channels variable identified percentages of the respondents across the above booking channels. Under the Bayesian approach, the frequencies of the channels variable equaled $P(\text{Channel})$, which also denoted the probabilities for a respondent to select a booking channel in the study. The probabilities of the type $P(\text{Channel})$ were assigned as priors for the Bayesian mechanism in the study.

*Influence of Demographic Factors on
Choices of Booking Channels*

To find out about whether the factors of genders and cultural origins influenced the respondents choices of booking channels, the study calculated and examined the likelihood functions of the types: (a) $P(\text{Channel}/\text{Gender})$, (b) $P(\text{Channel}/\text{Cultural origin})$. The likelihoods of the types $P(\text{Channel}/\text{Gender})$ and $P(\text{Channel}/\text{Cultural origin})$ were obtained from the percentages within the channels variable of cross tabulations of the channels variable with: (a) The gender variable and (b) the cultural origin variable.

*Sources of Hospitality Information and Motivations
behind Choices of Booking Channels*

According to the reviewed literature on hospitality booking, various booking channels differ in their characteristics from the consumers' perspectives. Channels are designed to satisfy various consumer needs and various behavioral habits (Green, 2005; O'Connor & Frew, 2002). Moreover, contemporary consumers have freedom to utilize various sources of hospitality information or combine sources of information while searching for accommodations ("Leisure travelers," 2005).

To find out whether differences in the respondents' ways of searching for hospitality information, and motivations behind utilizing a particular booking option would influence their choices of booking channels, the study calculated: (a) The information search variable, and (b) the choice motivators variable. The study also calculated and examined the likelihoods of the types $P(\text{Channel}/\text{Information source})$ and $P(\text{Channel}/\text{Choice motivator})$.

The likelihoods of the types $P(\text{Channel}/ \text{Information source})$ and $P(\text{Channel}/\text{Choice motivator})$ were obtained from the percentages within the channels variable of cross tabulations of the channels variable with: (a) the information search variable and (b) the choice motivators variable. who were motivated in their choices of booking channels by different channels' related factors.

Differences in Room Rates across

Booking Channels

According to the literature on hospitality booking channels, various channels are likely to offer different booking rates to consumers (Thompson, 2005). The study calculated the room rate variable and utilized descriptive statistics for obtaining and comparing the average room rate for the sample to average room rates for the groups of the respondents who selected different booking channels in the study. The study utilized ANOVA to determine whether differences in room rates among the groups of users of the booking channels in the study were significant.

The Bayesian Calculations

The Hotel Satisfaction Variable

The study calculated the hotel satisfaction variable (hotelsat variable) to measure the respondents' satisfaction with the hotel stays and assign prior conditional probabilities of the type $P(\text{HSR}/\text{Channel})$, which indicated the probabilities for a respondent to become highly satisfied with his/her hotel stay (HSR) given that he/she had selected a booking channel in the study. The study assigned the likelihoods of the type $P(\text{HSR}/\text{Channel})$ as prior conditional probabilities for the Bayesian mechanism.

To form the hotel satisfaction variable, the respondents marked their answers to the question: “Please, rate your satisfaction with your hotel stay,” on a seven-point Likert scale, where 1 indicated the lowest level of satisfaction, 4 indicated a neutral level of satisfaction, and 7 indicated the highest level of satisfaction. The respondents who marked 6 or 7 on the scale were considered highly satisfied with their hotel stays (HSR).

The study ran cross tabulations of the hotel satisfaction variable with the channels variable to obtain the numbers of the users across channels who had marked 6 or 7 on the scale of satisfaction with the hotel stays (n_2). The study calculated the likelihoods of the type P (HSR/Channel) as the ratios of n_2 to n_1 , where: (a) N_2 denoted the number of the respondents who became highly satisfied with the hotel stays given that they also had selected a channel in the study, (b) and n_1 denoted the number of the respondents in the sample who had selected this particular channel.

Posterior Likelihoods of the Parameters

To calculate the posterior likelihoods of the type P(Channel/HSR), which denoted the likelihoods for each channel in the study to supply to a hotel a student traveler who would become highly satisfied with his/her subsequent hotel stay, the study utilized Equation 3.

$$P(\text{Channel/HSR}) = \frac{P(\text{HSR} \cap \text{Channel})}{P(\text{HSR})} \quad (3)$$

In Equation 3, $P(\text{HSR} \cap \text{Channel})$ denoted the joint probability of observing simultaneously the event of high satisfaction with the hotel stays and a parameter of a channel. $P(\text{HSR})$ represented the density of the respondents who were highly satisfied with their hotel stays in the examined sample.

Regression Analysis

To investigate the factors of the respondents' booking experiences with the channels of their choices that may have influenced the respondents' satisfaction with the hotel stays, the study advanced a model to predict the hotel satisfaction variable (hotelsat variable) from the variables of experiences with booking channels as expressed by Equation 4:

$$\text{Hotelsat} = \beta_0 + \beta_1\text{BS} + \beta_2\text{RA} + \beta_3\text{FD} \quad (4)$$

The regressors in the model represented three important factors of customer experiences with booking channels that were identified by the literature in hospitality booking behaviors (Miller, 2004; Thompson, 2005): (a) Overall perception of being satisfied with booking experiences (BS regressor), (b) perception of feeling secure about finding an available room upon arrival to a hotel (RA regressor), and (c) perception of being offered a fair deal across channels (FD regressor). The literature maintained that customer perceptions of factors related to booking experiences may have contributed to building approving attitudes toward hospitality operations (Barsky & Nash, 2007; Jeong & Choi, 2004). To measure the factors of experiences with booking channels, the study asked the questions and calculated the variables indicated in Table 2.

Table 2

Factors of Experiences with Booking Channels

	Factor	Questionnaire items	Variables
1	Perception of being satisfied with booking experiences	Rate your satisfaction with your booking experience.	The booking satisfaction variable (BS variable)
2	Perception of feeling secure about finding an available room	Do you feel that the hotel would honor your reservation upon arrival?	The room availability variable (RA variable)
3	Perception of having a fair deal across channels	Do you feel that you could have gotten a better deal if you had booked in another way?	The fair deal variable (FD variable)

To calculate the booking satisfaction variable (BS variable), the room availability variable (RA variable), and the fair deal variable (FD variable), the study measured the factors of experiences with booking channels on the similar seven-point Likert scales as the scale that was utilized for measuring the respondents' satisfaction with the hotel stays (hotelsat variable).

To find out, which regressors in the study significantly contributed to the model expressed in Equation 4, the study ran stepwise regression procedures at the 0.05 and 0.1 significance levels respectively. Significance was viewed as significance for the regressors to contribute to the model's adjusted coefficient of multiple determination, also called significance of F (Montgomery & Peck, 1992).

At each examined level of significance of F, the study observed significance of t for each of the partial regression coefficients (Norusis, 2004). The t statistic was calculated

as a ratio of a partial regression coefficient to its standard error (Norusis). If the observed significance of t for a regressor was “very close to zero,” the study concluded that the partial regression coefficient calculated for the examined term significantly differed from zero, and the regressor significantly contributed to the model at the examined level of significance of F (Norusis, p. 235).

To conclude whether multicollinearity effect may have been a factor in calculating a partial regression coefficient, at each level of significance of F , the study also looked at the variance inflation factor (VIF) for each of the regressors (Montgomery & Peck, 1992). If the value of the variance inflation factor for the term (VIF) was less than 10, it was concluded that “the combined effect of the dependencies among the regressors” did not affect variance of the examined regressor, and did not impact calculations of the partial regression coefficient (Montgomery & Peck, p. 317). For each significant model obtained through stepwise regression procedure, adjusted coefficients of multiple determination were calculated to indicate the proportion of the variance of the predicted variable (hotelsat variable) that may have been explained by variability in the predictors (BS variable, RA variable, and FD variable) (Sheskin, 2000).

CHAPTER 4

DATA ANALYSIS

Sample Demographics

During the survey of UNLV students, 200 valid responses were obtained. A response was included in the study if a respondent answered the question about his/her booking channel and also ranked his/her level of satisfaction with the hotel stay. The study examined the demographic characteristics of genders and national origins that are known to influence the college students' traveling behaviors (Field, 1999, Shoham, Schrage, & Eeden, 2004). In the sample, 51.5% happened to be female students, 46.5% were male students, and four respondents did not answer the question about their genders. The sample contained more female students than male students, probably because 81.5% of the respondents were undergraduate students. According to the UNLV Office of Institutional Analysis and Planning (2006) the year when the study was conducted, female students constituted the majority (55.9%) among UNLV undergraduates (University of Nevada, Las Vegas).

In the study, 59.5% of the respondents happened to be American students, while 40.5% of the respondents were students of foreign origins. One student did not indicate his/her cultural origin on the questionnaire. Among the students of foreign origins in the study, 20 students happened to be from South Korea; 17 from Japan; 12 from Hon Kong and Taiwan; nine from India; seven from Indonesia and the Philippines; eight from

Europe and Canada; five from Mexico; and only one student arrived from the Middle East (Bahrain). The sample contained a larger proportion of the students of foreign origins than UNLV population (4.35%) because of the preponderance in the sample of students in hospitality, an international UNLV program (University of Nevada, Las Vegas, 2006, September 10). Hospitality students constituted 49% of the sample, while 23% were business students, and 24% were students pursuing majors other than hospitality or business. The area on campus where the survey was carried out more likely determined the sample's composition. The responses were collected in the vicinity of Frank and Estella Beam Hall, where the students in hospitality usually congregate and have classes.

To identify the respondents' preferred traveling destinations, the study calculated the destination variable. As well as the participants of the earlier studies of the college students' market segment, UNLV students favored traveling to resort destinations (Bai, Hu, & Countryman, 2004; Shoham et al., 2004). In the sample, 41.5% of the respondents traveled to California, Florida or Hawaii; 37% of the respondents traveled to U.S. destinations other than California, Florida or Hawaii; 16% of the respondents traveled abroad, and 5.5% did not answer the question about their traveling destinations.

The Booking Channels

Table 3 demonstrates percentages of the respondents who reported having utilized the booking channels in the study. From the Bayesian standpoint, frequencies of the channels variable equal $P(\text{Channel})$, the prior probabilities for a respondent to book a room through one of the channels in the study.

Table 3

Probabilities to Select a Channel: P(Channel)

Booking Channel	N	P(Channel)
Phone bookings	62	31.00%
Hospitality own sites	54	27.00%
Merchant sites	49	24.50%
Agent booking	13	6.50%
No booking	22	11.00%
All channels	200	100.00%

Table 3 shows that the respondents had higher probabilities to book a room through a self-serving, decentralized channel (booking by phone, booking through a hospitality own site or booking through a merchant site) than to utilize an agent (a travel agent or a connection in a hotel). . A respondent's probability to book a room through a hospitality proprietary channel (to book by phone or to book through a hospitality own site) was 58%, while a respondent's probability to book a room through an intermediary channel (to book through a merchant site or to utilize an agent) was 31%. The probability for a student to book through an Internet channel (a hospitality own site or a merchant site) was 51.5%, which was consistent with the Bai's et al. (2004) study's conclusion about students' preferences of planning trips online. At the same time, a large group of

students (37.5%) booked offline by calling a hotel or addressing an agent, which did not contradict Bai's et al. (2004) study's conclusion that the students who were not familiar with e-commerce or did not feel secure utilizing credit cards online would be less prompted to plan their trips online. A low probability for a respondent to book through an agent (6.5%) was consistent with the Field's (1999) study's conclusion about college students being reluctant to address travel agents.

Booking Channels across Different

Demographic Groups

Table 4 shows likelihoods for a male respondent ($P(\text{Channel}/M)$), for a female respondent ($P(\text{Channel}/F)$), and for a respondent, who did not indicate his/her gender ($P(\text{Channel}/NG)$), to select a channel in the study as compared with the probability for a respondent to select the same channel ($P(\text{Channel})$).

Table 4

Likelihood to select a Channel across Genders

Channels	Probability			
	(Channel/M)	(Channel/F)	(Channel/NG)	(Channel)
Phone Calls	30.11%	31.07%	50.00%	31.00%
Own sites	26.88%	26.21%	50.00%	27.00%
Merchant sites	22.58%	27.18%	0.00%	24.5%
Agent booking	5.38%	7.77%	0.00%	6.5%
No booking	15.05%	7.77%	0.00%	11.00%
All channels	46.5%	51.5%	2.00%	100.00%

According to Table 4, male respondents were noticeably more likely not to book in advance or not to participate in booking than female respondents. For a male respondent, the likelihood of not booking in advance was 15.05%, which was 1.94 times higher than the likelihood of not booking in advance for a female respondent (7.77%).

Table 5 shows likelihoods for an American respondent ($P(\text{Channel}/\text{AR})$), a respondent of a foreign origin ($P(\text{Channel}/\text{FR})$), and a respondent, who did not indicate his/her cultural origin ($P(\text{Channel}/\text{NCO})$), to select a channel in the study as compared with the probability for a respondent to select the same channel ($P(\text{Channel})$).

Table 5

Likelihood to select a Channel across Cultural Origins

Channels	Probability			
	(Channel/AR)	(Channel/FR)	(Channel/NCO)	(Channel)
Phone Calls	36.44%	23.46%	0.00%	31.00%
Own sites	25.42%	29.63%	0.00%	27.00%
Merchant sites	19.49%	30.86%	100.00%	24.5%
Agent booking	5.08%	8.64%	0.00%	6.5%
No booking	13.56%	7.41%	0.00%	11.00%
All channels	59.00%	40.50%	0.50%	100.00%

Table 5 demonstrates that a respondent of a foreign origin had a 1.55 times lower likelihood to call a hotel directly than a respondent of an American origin. At the same time, a respondent of a foreign origin had a 1.58 times higher likelihood to select a

merchant channel than an American respondent. In addition, a respondent of a foreign origin had a 1.7 times higher likelihood to book through an agent, than an American respondent; and a 1.83 times lower likelihood not to book in advance than an American respondent.

Booking Channels across Groups with Differences in

Information Search and Motivations

The respondents' answers to the question: "What sources did you use to collect information and decide in which hotel to stay?" formed the information search variable. Eight choices were offered to the respondents: (a) Using TV/magazine/newspaper ads, (b) visiting destination web sites, (c) visiting web sites for trips and vacation planning (the third-party sites), (d) visiting a hotel's or a chain's own site, (e) calling a hotel directly to ask for information, (f) getting references from somebody, (g) collecting hotel information in another manner, and (i) not collecting hotel information prior to the trip.

For analysis, attributes a, e, f, and g were collapsed on the category of offline sources, while attributes b, c, and d constituted the category of online sources. Because a respondent could have selected more than one option and could have reported utilizing online sources, as well as offline sources, the mixed sources category was also created. Frequencies calculated for the information search variable demonstrated that the respondents were more likely to utilize online sources of information (49.5%); while 32% of the respondents utilized mixed sources of information; 14% of the respondents utilized offline sources; and 4.5% of the respondents did not search for hospitality information prior to the trip. Table 6 demonstrates likelihoods for a respondent to select a booking channel given that he/she had also selected one or more sources of hospitality

information in the study. The likelihoods of the types $P(\text{Channel}/\text{Information source})$ were obtained from the percentages of cross tabulations of the channels variable with the information search variable.

Table 6

Likelihood to Select a Channel across Information Sources

Channels	Probability			
	(Channel/Online)	(Channel/Offline)	(Channel/Mixed)	(Channel/No Search)
Phone Calls	22.20%	50.00%	40.6%	0.00%
Own sites	32.30%	7.10%	29.70%	11.10%
Merchant sites	40.4%	3.06%	12.50%	0.00%
Agent booking	1.00%	14.30%	12.50%	0.00%
No booking	4.00%	25.00%	4.0%	88.89%
All channels	49.50%	14.00%	32.00%	4.50%

Note. $P(\text{Channel}/\text{Online})$ is the conditional probability to selected a channel in the study for a respondent who utilized an online source of hospitality information; $P(\text{Channel}/\text{Offline})$ is the conditional probability to selected a channel in the study for a respondent who utilized an offline source of information; $P(\text{Mixed}/\text{Channel})$ is the conditional probability to selected a channel in the study for a respondent who utilized a mixed source of information; $P(\text{Channel}/\text{No search})$ is the conditional probability to selected a channel in the study for a respondent who did not search for hospitality information in advance.

According to Table 6, the respondents who searched for hospitality information online were more likely to book accommodations also online: 40.4% of the respondents who searched for information online utilized a merchant site and 32.3% utilized a hospitality own site. However, some respondents searched for information online, but booked a room by phone (22%). The respondents who searched for hospitality information offline, were also more likely to book offline (50% booked accommodations by phone, 14.3% addressed a travel agent). The respondents, who searched for hotel information through mixed sources, were more likely to book by phone (40%), and the respondents who did not search for information prior to the trip, were the most likely not to book accommodations in advance or not participate in booking (88.89%). Table 6 shows likelihoods for a respondent to select a channel in the study given that he/she was motivated by a particular channel's related factor (choice motivator). The likelihoods of the types $P(\text{Channel/Motivator})$ were obtained from the percentages of cross tabulations of the channels variable with the channels motivators variable.

The choice motivators variable was formed from the answers to the question: "Why did you choose this particular way of booking?" For analysis, the respondents' answers were collapsed into seven groups: (a) Convenience of using the source (convenience), (b) perception that the channel offers a low rate across channels (rate expectations), (c) concerns about finding an available room upon arrival to a hotel (room availability), (d) possibility to ask questions (interactivity), (e) possibility to compare accommodation options at the same location (comparison), (f) perception of the channel as a source of hospitality expertise (expertise), (g) perception of being deficient in skills or time for utilizing other channels (deficiencies).

Frequencies of the choice motivators variable demonstrated that, inside the sample, a respondent had the highest probability to become motivated by convenience of a channel. According to the respondents, a convenient channel would satisfy all the needs of a traveler with relation to booking accommodations. A convenient channel also would be simple and quick to use, would be easily available to customers, and would be accessible at all times. In the sample, convenience of a channel motivated 41% of the respondents; 12.5% of the respondents were motivated by low rates' expectations; and 12% by perceptions of finding a room available to them upon arrivals. Expertise provided by a channel motivated 11% of the respondents; interactivity of a channel 10%; possibility to compare options across channels motivated 8.5% of the respondents; and deficiency in skills or time motivated 5% of the respondents.

According to Table 7, the respondents who were motivated by convenience of a channel were more likely to book by phone or through a hospitality own site (32.9% and 31.7% respectively). The respondents, who expected to find a low rate across channels, were more likely to book through a merchant site (52%). The respondents, who were concerned about finding a room available to them upon arrival to a hotel, were more likely to book through a hospitality own site (50%) or to book by phone (45.8%). The majority of the respondents motivated by interactivity of a channel would book by phone (75%). The respondents, who were interested to compare options across channels, were more likely to utilize a merchant site (75%). The respondents, who were looking for expertise provided by a channel, were more likely not to participate in booking as group members (54.5%) or to rely on an agent (22.7%). The respondents, who reported deficiency in skills or time, were more likely not to book in advance (50%).

Table 7

Likelihood to Select a Channel across Motivations

		Probability					
	Motivator (M)	(Call/M)	(Own/M)	(Merchant/M)	(Agent/M)	(NB/M)	(M)
a)	Convenience	32.90%	31.70%	25.60%	3.70%	6.10%	41.00%
b)	Rate expectation	12.00%	28.00%	52.00%	8.00%	0.00%	12.50%
c)	Room availability	45.80%	50.00%	4.02%	0.00%	0.00%	12.00%
d)	Interactivity	75.00%	10.00%	5.00%	10.00%	0.00%	10.00%
e)	Comparison	5.90%	29.40%	64.70%	0.00%	0.00%	8.50%
f)	Expertise	13.60%	4.50%	4.50%	22.70%	54.50%	11.00%
g)	Deficiencies	20.00%	10.00%	10.00%	10.00%	50.00%	5.00%

Note. P(Call/M) is the conditional probability for a respondent to book by phone given that he/she was motivated by a particular factor; P(Own/M) is the conditional probability for a respondent to utilized a hospitality own site, P(Merchant/M) is the conditional probability for a respondent to utilize a merchant site; P(Agent/M) is the conditional probability to book through an agent; P(NB/M) is the conditional probability not to book in advance or not to participate in booking. P (M) is the probability for a respondent in the study to become motivated by a channel's related factor in the study.

Daily Rates across Booking Channels

The study formed the room rate variable from the answers to the question: "What was your room rate?" One hundred fifty two respondents answered the question about their room rates. Descriptive statistics obtained for 152 cases of the room rate variable indicated that 7% of the respondents paid no more than \$50 per a room/night; 15% of the respondents paid from \$55 to \$75 per a room/night; the majority of the respondents

(61%) paid from \$ 80 to \$ 180 per a room/night; 13% of the respondents paid from \$200 to \$300 per a room/night; and 4% of the respondents paid more than \$300. The highest room rate in the sample represented \$ 460 per a room/night. The sample's average room rate was \$134.

On average: (a) The respondents who booked by phone paid \$ 148 for a room/night, (b) the users of hospitality own sites paid \$140 per a room/night, (c) the users of the merchant sites paid \$ 103 per a room/night (the lowest average rate in the sample), (d) the respondents who utilized an agent for booking paid \$164 (the highest average rate in the sample), and (e) the respondents who did not book in advance paid \$ 113.

According to the analysis of variance calculated for the room rate variable and the channels variable, differences in room rates across the booking channels were highly significant. Table 8 summarizes the ANOVA's results.

Table 8

Variance of Daily Room Rates across Booking Channels

Daily rates	Mean Square	F	Significance of F
Between groups	14228.009	2.495	0.045
Within groups	5702.330		

In Table 8, the observed value of F, which was calculated as a ratio of the between groups mean square to the within groups mean square, was high enough (2.495) for differences in booking channels' selection to influence differences in daily rates of the users of various channels in the study at the 0.045 significance level.

The Bayesian Calculations

To obtain the Bayesian calculations of the posterior likelihoods of the type $P(\text{Channel}/\text{HSR})$, the study assigned two types of prior probabilities: (a) $P(\text{Channel})$, denoted the prior distribution of the parameters observed by the study and (b) $P(\text{HSR}/\text{Channel})$, which denoted the prior distribution of the event examined in the study across the observed parameters. Calculations of the prior probabilities of the type $P(\text{Channel})$, were demonstrated in Table 3. The following section explains calculations of the prior conditional probabilities of the type $P(\text{HSR}/\text{Channel})$, which represented the probabilities for a respondent in the study to become highly satisfied with his/her hotel stay given that he/she had selected a booking channel in the study.

Prior Likelihoods of the Event

across Parameters

The study measured the respondents' satisfaction with the hotel stays on a seven-point Likert scale. For the sample, the mean value of satisfaction with the hotel stays was 5.42, while the median value was 5.5. The respondents who marked 6 or 7 on the scale of satisfaction with the hotel stays were considered being the highly satisfied respondents (HSR). The study viewed the likelihoods of the type $P(\text{HSR}/\text{Channel})$, as the prior likelihoods of the event (HSR) across the parameters of the study (the booking channels). The likelihoods of the type $P(\text{HSR}/\text{Channel})$ were calculated as ratios of n_2 to n_1 ($P(\text{HRS}/\text{Channel}) = n_2/n_1$). N_2 denoted the number of the respondents inside a channel who reported a high level of satisfaction with the hotel stays, and n_1 denoted the number of the respondents in the sample who had selected the same booking channel. The calculations are shown in Table 9.

Table 9

Calculations of the Likelihoods $P(HS/Channel)$

Booking channels	n1	n2	P(HSR/Channel)
Phone calls	62	27	43.55%
Own sites	54	27	50.00%
Merchant sites	49	25	51.02%
Other booking	13	8	61.54%
No booking	22	13	59.09%
All Channels	200	100	50.00%

Note. $P(HSR/Channel) = n2/n1$.

According to the bottom row of Table 9, in the sample, the number of the respondents equaled 200. The number of the respondents who marked 6 or 7 on the Likert scale of satisfaction with the hotel stays equaled 100. Therefore, $P(HSR)$, which denoted the probability for a respondent in the sample to become highly satisfied with his/her hotel stay equaled 50%. For a respondent who booked through a hospitality own site, the probability to become highly satisfied with his/her hotel stay equaled the probability of high satisfaction for a respondent in the sample (50%).

For a respondent who booked by phone, the probability to become highly satisfied with his/her hotel stay (43%) was lower than the probability of high satisfaction with the hotel stays for a respondent in the sample. For a respondent who booked through a merchant site, utilized an agent, did not book in advance or did not participate in booking, the probability to become highly satisfied with the hotel stays was higher than the probability of high satisfaction with the hotel stays in the sample.

Posterior Likelihoods of the Parameters

Table 10 shows calculations of likelihoods of the type $P(\text{Channel}/\text{HSR})$, which denoted the posterior probabilities for a booking channel in the study to supply to an operation a student traveler who would become highly satisfied with his/her hotel stay. The calculations were made according to Equation 3:

$$P(\text{Channel}/\text{HSR}) = \frac{P(\text{HSR} \cap \text{Channel})}{P(\text{HSR})} \quad (3)$$

In Equation 3, the quantity $P(\text{HSR} \cap \text{Channel})$ denoted the joint probability of observing simultaneously in the study the event of high satisfaction with hotel stays and a parameter of a channel. $P(\text{HSR} \cap \text{Channel})$ also could have been interpreted as the percentage of the respondents who were highly satisfied with their hotel stays and also were supplied by a particular booking channel. $P(\text{HSR})$ denoted the probability for a respondent in the sample to become highly satisfied with his/her hotel stay. Table 10 illustrates calculations of the posterior conditional probabilities of the type $P(\text{HSR}/\text{Channel})$.

Table 10

Posterior Likelihoods of the Parameters

Channels	Probability			
	(Channel)	(HSR/Channel)	(HSR \cap Channel)	(Channel/HSR)
Phone bookings	31.00%	43.55%	13.50%	27.00%
Own sites	27.00%	50.00%	13.50%	27.00%
Merchant sites	24.50%	51.02%	12.50%	25.00%
Agent booking	6.50%	61.54%	4.00%	8.00%
No booking	11.00%	59.09%	6.50%	13.00%
All channels	100.00%	50.00%	50.00%	100.00%

Note. $P(\text{Channel})$ is the prior probability for a respondent to select a channel in the study.

$P(\text{HSR}/\text{Channel})$ is the prior conditional probability for a respondent to become highly satisfied with his/her hotel stay given that he/she had selected a channel in the study. $P(\text{HSR} \cap \text{Channel})$ is the joint probability for the event of high satisfaction and the parameter of a booking channel to be observed simultaneously in the study. $P(\text{Channel}/\text{HSR})$ is the posterior conditional probability for a booking channel in the study to supply to an operation a student traveler who would become highly satisfied with the hotel stay.

In Table 10, the values in the column $P(\text{HSR} \cap \text{Channel})$ equal the values in the column $P(\text{Channel})$ multiplied by the values in the column $P(\text{HSR}/\text{Channel})$. The values in the column $P(\text{Channel}/\text{HSR})$ equal the values in the column $P(\text{HSR} \cap \text{Channel})$ divided by the value of $P(\text{HSR})$, which was 50% (the value indicated in the bottom row of the column $P(\text{HSR} \cap \text{Channel})$).

Table 10 shows that the hospitality own channels, such as booking by phone and booking through hospitality own sites, had the highest posterior likelihoods in the sample (27% respectively) to supply to an operation a student traveler who would become highly satisfied with his/her hotel stay. Therefore, in the sample, for the hospitality proprietary channels (booking by phone and booking through hospitality own sites), the likelihood of supplying a highly satisfied student customer to an operation equaled 54%. For the intermediary channels (booking through merchant sites and booking through various agents) the likelihood to supply a highly satisfied student customer to an operation equaled 33%. The likelihood that a highly satisfied student customer would come from the group of the respondents who did not book in advance or did not participate in booking equaled 13%.

As the study has already demonstrated, the students who booked through hospitality own channels were high paying customers who tended to pay more for a room/night than the average room rate for the sample. The respondents who booked by phone paid \$ 148 and the respondents who booked through a hospitality own site paid \$ 140, as compared to the sample's average of \$134. The trend for a high paying customer to also become highly satisfied with the hotel stays may be considered favorable for an operation because the customers who feel highly satisfied usually tend to be less price sensitive (Miller, 2004). At the same time, high paying customers who feel that they have not been overcharged for the hotel stays are likely to develop loyalty to an operation and attract even more high paying customers through a favorable word-of-mouth (Söderlund & Ohman, 2005). The following section demonstrates which factors of the experiences with booking channels were likely to influence customer satisfaction with hotel stays.

Regression Analysis

The study advanced a model to predict the hotel satisfaction variable (hotelsat variable) from the variables of experiences with booking channels: (a) Booking satisfaction variable (BS variable), (b) room availability variable (RA variable), and (c) fair deal variable (FD variable), as expressed in Equation 4:

$$\text{Hotelsat} = \beta_0 + \beta_1\text{BS} + \beta_2\text{RA} + \beta_3\text{FD} \quad (4)$$

In Equation 4, the regressors represented three important factors of customer experiences with booking channels that were identified by the literature in hospitality booking behaviors: (a) Overall perception of being satisfied with booking experience (BS regressor), (b) perception of feeling secure about finding an available room upon arrival to a hotel (RA regressor), and (c) perception of being offered a fair deal across channels (FD regressor) (Miller, 2004; Thompson, 2005).

To find out, which regressors significantly contributed to the model, the stepwise procedure was run at the 0.05 and 0.1 significance levels of F respectively. Significance of F was defined as significance for the regressors to contribute to the model's adjusted coefficient of multiple determination (Montgomery & Peck, 1992). The procedure demonstrated that at the examined significance levels, only the booking satisfaction variable (BS variable) entered the model, as shown in Equation 5:

$$\text{Hotelsat} = \beta_0 + \beta_1\text{BS} \quad (5)$$

Table 11 summarizes the results of the stepwise procedures that were the same at 0.05 and 0.1 levels of significance of F.

Table 11

Stepwise Regression Procedure

Model	Coefficient	t	Significance of t	VIF
Constant	4.021	13.018	0.000	
BS	0.26	4.723	0.000	1
Excluded variables				
RA	0.137	1.578	0.116	1.666
FD	0.017	0.237	0.813	1.087

According to Table 11, at the 0.05 level of significance of F, only for the booking satisfaction variable (BS variable) significance of t, the statistic calculated as a ratio of a partial regression coefficient to its standard error, was “very close to zero” (Norusis, 2004, p. 234). Thus, only the booking satisfaction variable (BS variable) had the partial regression coefficient significantly greater than zero. The room availability variable (RA variable) and the fair deal variable (FD variable) were not multicollinear (the observed VIF values were smaller than 10). However, significance of t calculated for RA variable and for FD variable were too large for RA variable or FD variable to enter the model at the 0.05 significance level. For the room availability variable (RA variable), to enter the predictive model, the significance level should be increased to a level that would be higher than the 0.116 level.

According to the results of the stepwise procedure, at the 0.05 significance level, the hotel satisfaction variable can be predicted from the booking satisfaction variable as shown in Equation 6:

$$\text{Hotelsat} = 4.021 + 0.26\text{BS} \quad (6)$$

The equation 6 demonstrates that, at the examined significance level, a positive relationship was observed between a respondents' overall satisfaction with booking experiences and his/her satisfaction with the subsequent hotel stay. If a respondent's overall satisfaction with booking experiences was increased by 1 point, his/her satisfaction with the hotel stay increased by 0.26 points. At the significance level of 0.05, overall satisfaction with booking experiences was the only factor among the factors of experiences with booking channels examined in the study to influence the respondents' satisfaction with the hotel stays. For Equation 6, the adjusted coefficient of multiple determination was 0.097, which meant that only 9.7% of variance in satisfaction with the hotel stays depended upon variability in overall satisfaction with booking experiences (Sheskin, 2000).

The results of the regression analysis of the proposed study about significant correlation found for overall satisfaction with the respondents' booking experiences and their satisfaction with the hotel stays are comparable with the results of the 2006 Market Metrix Hospitality Index study (the MMHI study) conducted among 35,000 hospitality consumers across all the segments of the hospitality market. According to Barsky and Nash (2007), the 2006 MMHI study found that hospitality consumers' overall satisfaction with booking experiences positively correlated with their satisfaction with the hotel stays.

According to the MMHI study, in 2006, hospitality consumers were increasingly utilizing hospitality proprietary booking channels (booking by phone and booking through hospitality own web sites) (Barsky & Nash, 2007). The 2006 MMHI study's respondents maintained that their experiences with hospitality proprietary booking channels were integral parts of their overall experiences with hotels (Barsky & Nash). Moreover, the respondents of the MMHI study pointed out that feelings of satisfaction with experiences with hospitality proprietary booking channels reinforced their positive disposition toward the prospective hospitality operations (Barsky & Nash).

The proposed study found, however, that, at 0.05 significance level, only 9.7% of variance in satisfaction with the hotel stays depended upon variability of overall satisfaction with booking experiences. A small adjusted coefficient of multiple determination (9.7%) obtained for the equation to predict the respondents' satisfaction with the hotel stays from their overall satisfaction with booking experiences can be explained by two factors: (a) A relatively low probability for a respondent in the study to select a hospitality proprietary channel (58%; see Table 3) and (b) the design of the study that gathered the data from the respondents who had stayed in different hotels.

In the proposed study, the probability for a respondent to select a hospitality proprietary channel equaled 58% (see Table 3). At the same time, according to the 2006 MMHI study, the hospitality consumers who booked through hospitality proprietary channels maintained that their overall experiences with hospitality own booking channels influenced their experiences with the hotel stays (Barsky & Nash, 2007). Thus, it may be concluded that if the probability for a respondent to select a hospitality proprietary channel in the proposed study had been higher, a positive relationship between the

respondents' overall satisfaction with booking experiences and their satisfaction with the subsequent hotel stays may have been stronger. A stronger relationship between overall satisfaction with booking experiences and satisfaction with the hotel stays may have resulted in a higher adjusted coefficient of multiple determination for the equation to predict satisfaction with the hotel stays from overall satisfaction with booking experiences.

Moreover, in the proposed study, the survey's data were collected from the respondents who had stayed in different hotels. Differences in services provided by different hotels may have significantly influenced differences in levels of satisfaction with the hotel stays. If the data had been collected from the guests of the same hotel, differences in satisfaction with overall booking experiences obtained through different channels may have influenced satisfaction with the hotels stays to a greater extent. If the study conducted among the guests of the same hotel had discovered a strong positive relationship of overall satisfaction with booking experiences and the subsequent hotel stays, the adjusted coefficient of multiple determination for the equation to predict satisfaction with the hotel stays from overall satisfaction with booking experiences may have been higher than 9.7%, the adjusted coefficient of multiple determination calculated in the proposed study.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Summary of the Finding

The study conducted a survey among the UNLV students who recently traveled and stayed in a hotel and examined the respondents' satisfaction with the hotel stays under the parameters of booking channels that they had utilized to reserve accommodations. The study considered five channels for analysis: (a) booking by phone, (b) booking through a hospitality own site, (c) utilizing a merchant site, (d) booking through an agent, and (e) not booking in advance (Burns & Inge, 2004).

According to the study, differences in room rates paid by the respondents across booking channels were significant at the 0.045 level (see Table 8). The average room rate for the sample equaled \$134. The respondents who booked through agents paid the highest average rate in the sample (\$164); the respondents who booked by phone and through hospitality own sites paid more for a room/night than the sample's average (\$148 and \$140 respectively); and the respondents who booked through merchant sites or did not book in advance paid less than the sample's average (\$103 and \$113 respectively).

The study found that a respondent's probability to choose a booking channel varied across channels. A respondent in the sample was more likely to utilize a self-serving, decentralized channel (booking by phone, booking through a hospitality own site, and booking through a merchant site). Among the self-serving, de-centralized channels, a

respondent had the highest probability to book by phone (31%), while he/she had a 27% probability to book through a hospitality own site, and a 24.5% probability to book through a merchant site. At the same time, a respondent had a 6.5% probability to book through an agent and an 11% probability not to book in advance. A respondent's probability to book a room through a hospitality proprietary channel was 58%, while a respondent's probability to book a room through an intermediary channel was 31%. The ratio of the respondents who utilized hospitality own sites (54 respondents) to all the respondents who booked online (103 respondents) was 52.42%.

The purpose of the study was to examine the respondents' high satisfaction with the hotel stays under the parameters of booking channels. The respondents, who marked 6 or 7 on a seven-point Likert scale of hotel satisfaction, were considered highly satisfied with their hotel stays. The mean value for hotel satisfaction in the sample was 5.42. The median value was 5.5. The probability of high satisfaction with the hotel stay for a respondent in the sample equaled 50%. The study established that the respondents who chose different channels had different likelihoods to become highly satisfied with their hotel stays.

For the respondents who booked by phone, the likelihood to become highly satisfied with their hotel stays was lower than the sample's likelihood (43.5%). For the respondents who booked through hospitality own sites, the likelihood to become highly satisfied with the hotel stays equaled the sample's likelihood (50%). For the respondents who booked through merchant sites, utilized various agents or did not book in advance, the likelihood to become highly satisfied with the hotel stays was higher than for the sample.

The proposed study utilized the Bayesian approach and calculated percentages of the respondents who were highly satisfied with their hotel stays and supplied by each channel in the study ($P(\text{HSR} \cap \text{Channel})$). According to the calculations, 13.5% of all the respondents in the study, who were highly satisfied with their hotel stays, booked by phone; 13.5% booked through hospitality own sites; 12.5% booked through merchant sites; 4% booked through various agents; and 6.5% did not book in advance.

The Bayesian calculations of the posterior likelihoods for the booking channels in the study to supply highly satisfied student travelers to an operation showed that booking by phone had a 27% likelihood of supplying to a hospitality operation a student customer who would be highly satisfied with his/her hotel stay; booking through a hospitality own site also had a 27% likelihood; booking through a merchant site had a 25% likelihood; booking through various agents had an 8% likelihood; and not booking in advance had a 13% likelihood to supply to an operation a student customer who would be highly satisfied with his/her hotel stay.

The results of the regression analysis of influence of factors of experiences with booking channels on satisfaction with the subsequent hotel stays demonstrated that at the 0.05 significance level, the overall satisfaction with booking channels would be the single factor to have an influence on satisfaction with the hotel stays with the adjusted coefficient of multiple determination of 9.7%.

Conclusion, Limitations, and Recommendations

Conclusion fort the Bayesian Calculations

UNLV students favored decentralized and self-serving hospitality booking channels: booking by phone, utilizing a hospitality own site, or utilizing a merchant site. Among the decentralized booking channels, the respondents who utilized merchant sites had a higher likelihood to become highly satisfied with their hotel stays (51.02%) than the respondents who utilized hospitality own sites (50.00%), and the respondents who booked by phone (43.55%). However, a respondent in the sample had only a 24.5% probability of selecting a merchant site, while his/her probability of selecting a hospitality own site was 27%, and the probability of booking by phone was 31%.

The Bayesian calculations showed that booking by phone or booking through a hospitality own site had a higher probability to supply to an operation a student traveler who would become highly satisfied with his/her hotel stay (27% respectively) than booking through a merchant site (25%) or booking though an agent (8%). The probability for the hospitality proprietary channels to supply to an operation a highly satisfied student traveler was 54%, while the probability for the intermediary channels (booking through a merchant site or booking through various agents) was 33%.

Conclusion for the Regression Analysis

The study established that overall satisfaction with booking experiences was the only factor among the factors of experiences with booking channels examined in the study to influence the respondents' satisfaction with the hotel stays at the 0.05 significance level. Characteristically, the 2006 Market Metrix Hospitality Index study (the MMHI study) conducted among 35,000 hospitality consumers across all the segments of the hospitality

market also established positive correlation between hospitality consumers' overall satisfaction with booking experiences and their satisfaction with the subsequent hotel stays (Barsky & Nash, 2007). The proposed study also found that, at 0.05 significance level, only 9.7% of variance in satisfaction with the hotel stays depended upon variability of overall satisfaction with booking experiences.

The study concluded that two factors may have determined a weak character of the relationship between the respondents' overall satisfaction with booking experiences and their satisfaction with the subsequent hotel stays: (a) A relatively low probability for a respondent in the study to select a hospitality proprietary booking channel (58%) and (b) the design of the study that gathered the data from the respondents who had stayed in different hotels. The study suggested that if the probability for a respondent in the study to select a hospitality proprietary channel had been higher, the relationship between the respondents' overall satisfaction with booking experiences and their satisfaction with the subsequent hotel stays might have been stronger.

At the same time, if the data had been collected from the guests of the same hotel, differences in satisfaction with overall booking experiences obtained through different channels may have influenced satisfaction with the hotels stays to a greater extent. If the study conducted among the guests of the same hotel had discovered a strong positive relationship of overall satisfaction with booking experiences and the subsequent hotel stays, the adjusted coefficient of multiple determination for the equation to predict satisfaction with the hotel stays from overall satisfaction with booking experiences may have been higher than 9.7%, the adjusted coefficient of multiple determination calculated in the proposed study.

Recommendations

The results of the proposed study demonstrated that hospitality proprietary booking channels (booking by phone and booking through a hospitality own site) supplied the majority of the highly satisfied student travelers in the study (54%). At the same time, hospitality proprietary channels also supplied student travelers who tended to pay more for a room/night than the average room rate for the sample. The average daily rate for the respondents who booked by phone constituted \$ 148 and the average daily rate for the respondents who booked through hospitality own sites constituted \$ 140, as compared to the sample's average daily rate of \$ 134.

Because high satisfaction with hotel stays is viewed by hospitality theorists as an emotional component of customer loyalty (Alegre & Cladera, 2006; Söderlund & Ohman, 2005), it may be expected that the high paying student travelers supplied to an operation through hospitality proprietary booking channels would re-patronize the operation and also would spread a favorable opinion about the operation through word-of-mouth (Miller, 2004; Söderlund & Ohman, 2005).

A trend discovered by the study for a student traveler to utilize hospitality proprietary distribution channels to the greater extent than the intermediary channels is also favorable for an operation because distributing inventory through the intermediary channels is usually associated with high fees for the operations and may lead to the erosion of the value of hospitality brands (Churchill, 2005; Miller, 2004). Miller (2004) and Thompson (2005) also pointed out that allocating hospitality inventory to hospitality own sites represented the most cost-efficient way of distributing hospitality inventory.

The finding of the proposed study may be utilized to increase the probability for hospitality own sites to provide to an operation a student traveler who would become highly satisfied with his/her hotel stay. The proposed study found that 32.3% of the students who searched for hospitality information exclusively online and 29.7% of the students who combined online and offline sources while searching for hospitality information tended to book through hospitality own sites. Thus, to reinforce the trend for a student traveler to book through a hospitality own site, an operation should increase visibility of its own portal on the Internet through online and offline advertisement.

The study established that, in their choices of a booking channel, the majority of the student respondents were motivated by convenience of a channel. Fifty percent of those who were motivated by convenience of a channel were likely to book through a hospitality own site. Thus, to increase satisfaction with overall experiences with hospitality own sites, it may be recommended to make sure that an operation's own portal would be convenient to use by student customers. A convenient portal would be quick and easy to utilize, and also would be accessible and available at all times.

Future Research

The results of analysis of the data obtained through surveying UNLV students cannot be generalized on populations of other universities because students' traveling behaviors are usually determined by a university's type and location (Field, 1999; Shoham et al., 2004). Students of other universities may differ from UNLV students in the ways of searching for hospitality information, choosing traveling destinations, selecting hospitality booking channels, as well as assessing their satisfaction with booking experiences and experiences within hotels.

Furthermore, Shoham, Schrage, and Eeden (2004) emphasized that college students represent a narrow segment of the hospitality market that is characterized by specific behaviors, which may differ from behaviors of consumers from other segments of the hospitality market. One of the noticeable differences between the UNLV students who participated in the proposed study and the participants of the 2006 MMHI study (the Market Metrix Hospitality Index study) among 35,000 travelers from various segments of the hospitality market consists in a higher propensity for UNLV students to utilize hospitality own sites. In 2006, the MMHI study found that 50.2% of the online bookings in the study were made through hospitality own sites (Barsky & Nash, 2007), while 52.4% of the online bookings in the proposed study were made through hospitality own sites.

The 2006 MMHI study also found that the booking behaviors of hospitality consumers would vary across hospitality chains and individual properties. Although the MMHI study noticed that, in 2006, hospitality consumers increasingly utilized online booking channels, the study also reported that only 40% of the guests of Best Western International booked accommodation online, while over 60% of all the bookings placed to Choice Hotels International were online bookings (Barsky & Nash, 2007). Because distributions of hospitality consumers by booking channels may vary across hospitality chains and individual hotels, in order to further investigate influence of differences in consumer choices of booking channels on differences in consumer satisfaction with the hotel stays, a study might be conducted among the guests of a single hotel, which distributes its inventory through various booking channels.

When a study is carried out among the guests of the same hotel, the hotel's registration system may provide information about the guests' distributions by booking channels. To find out about the levels of guest satisfaction within the hotel, a short survey might be conducted at checkouts. In a study among the guests of a single hotel, variability of satisfaction with the hotel stays observed for the users of different booking channels more likely would reflect differences in consumer perceptions of hotel services across channels. If a study among the guests of the same hotel discovers significant differences in satisfaction with hotel stays for the users of various booking channels, the study also will be likely to find a strong positive correlation of the guests' overall satisfaction with booking experiences and their satisfaction with the subsequent hotel stays.

The participants of the 2006 MMHI study maintained that their overall experiences with hospitality own booking channels influenced their experiences with the hotel stays (Barsky & Nash, 2007). Based on the MMHI study's finding, it may be expected that the higher will be the probability for a guest to book a room through the hotel's proprietary channel, the stronger may be the positive relationship of the guests' satisfaction with overall booking experiences and satisfaction with the subsequent hotel stays. A study among the guests of a single hotel may also find that, at the 0.05 significance level, the guests' satisfaction with the hotel stays would positively correlate not only with the guests' overall perceptions of satisfaction with booking experiences, but also with their perceptions of feeling secure about finding a room available to them upon arrivals to the hotel.

BIBLIOGRAPHY

- Alegre, J., & Cladera, M. (2006). Repeat visitation in mature sun and sand holiday destinations. *Journal of Travel Research*, 44, 288-297.
- Bai, B., Hu, C., Elsworth, J., & Countryman, C. (2004). Online travel planning and college students: The spring break experience. *Journal of Travel & Tourism Marketing*, 17(2/3), 79-91.
- Barnard, G. (2002). Thomas Bayes: A biographical note. In R. Swinburne (Ed.), *Bayes's theorem* (pp. 21-38). New York: Oxford University Press.
- Barsky, J., & Nash, L. (2007). Hotel web sites scroll to the top in customer satisfaction. *Hotel and Motel Management*, 22(3), 8-12.
- Burns, J., & Inge, J. (2004, Summer). Distribution technology: Hold your horses! *Hospitality Upgrade*, 10-16.
- Churchill, D. (2005, April). What's in a name? *Business Travel World*, 43-45.
- Connolly, D., Olsen, M., & Moore, R. (1998). The Internet as a distribution channel. *Cornell Hotel and Restaurant Administration Quarterly*, 39(4), 42-53.
- Deal, K. (2006). Bayes Watch. [Review of the book *Bayesian statistics and marketing*]. *Marketing Research*, 18(1), 38-41.
- Ferguson, D., & Selling, T. (1985). Probability analysis: A system for making better decision. *Cornell Hotel and Restaurant Administration Quarterly*, 25(2), 35-43.
- Field, A. (1999). The college student market segment: A comparative study of travel

behaviors of international and domestic students at a southeastern university.

Journal of Travel Research, 37, 375-381.

Green, G. (2005, Summer). De-Mystifying distribution. *Hospitality Upgrade*, 39-42.

Hotels' web sites hit back at third-parties. (2005). *Caterer & Hotelkeeper*, 194(43), 13.

IHG boosts online booking. (2005, July 10). *Business Travel World*, 8.

J.D. Power study: Overall guest satisfaction on the rise. (2005). *Hotel & Motel*, 220(15),

4.

Jeong, M., & Choi, J. (2004). Effects of picture presentations on customers' behavioral intentions on the Web. *Journal of Travel & Tourism Marketing*, 17(2/3), 193-204.

Kumar, V., Venkatesan, R., & Rejnartz, W. (2006). Knowing what to sell, when, and to whom. *Harvard Business Review*, 84(3), 90-99.

Leisure travelers' online booking behaviors. (2005). *Travel Agent*, 320(8), 8.

Miller, B. (2004). Building e-loyalty of lodging brands: Avoiding brand erosion. *Journal of Travel & Tourism Marketing*, 17(2/3), 133-142.

Montgomery, D., & Peck, E. (1992). *Introduction to linear regression analysis* (2nd ed.).

New York: A Wiley-Interscience Publication.

Norusis, M. (2004). *SPSS 12.0: Guide to data analysis*. Upper Saddle River "NJ":

Prentice Hall.

O'Connor, P., & Frew, A. (2002). The future of hotel electronic distribution: Expert and industry perspectives. *Cornell Hotel and Restaurant Administration Quarterly*,

43(3), 33-46.

Retzer, J. (2006). The century of Bayes. *International Journal of Market Research*, 48(1),

49-59.

- Rossi, P., Allenby, G., & McCulloch, R. (2005). Bayesian statistics and marketing: Bayesian essentials and regressions (PowerPoint slides). Retrieved December 12, 2006, from University of Chicago Graduate School of Business Web site: <http://faculty.chicagogsb.edu/peter.rossi/teaching/37904/classnotes/bayesian%20essentials%20and%20regression.ppt#257,1>, Bayesian Essentials and Bayesian Regression
- Seller's market? Yup. (2005). *Successful Meetings*, 54(8), 13.
- Sen, A. (2000). Inventory and pricing models for perishable products. Unpublished doctoral dissertation, University of Southern California. (UMI No. 3018124)
- Sheskin, D. (1997). *Handbook of parametric and nonparametric statistical procedures*. New York: CRC Press.
- Shoham, A., Schrage, C., & Eeden, S. (2004). Student travel behavior: a cross-national study. *Journal of Travel & Tourism Marketing*, 17(4), 1-11.
- Sober, E. (2002). Bayesianism: Its scope and limits. In R. Swinburne (Ed.), *Bayes's theorem* (pp. 21-38). New York: Oxford University Press.
- Söderlund, M., & Ohman, N. (2005). Assessing behavior before it becomes behavior: An examination of the role of intentions as a link between satisfaction and re-patronizing behavior. *International Journal of Service Industry*, 16(2), 169-185.
- Thompson, G. (2005). Hotel room rates across booking channels. *Cornell Hotel and Restaurant Administration Quarterly*, 46(2), 106-107.
- University of Nevada, Las Vegas. Office of Institutional Analysis and Planning. Undergraduate student profile. (2006). Retrieved February 2, 2007 from http://ir.unlv.edu/reports/profile_reports/Undergraduate_Student_Profile.pdf

University of Nevada, Las Vegas. (2006, September 10). UNLV Highlights. Retrieved October 21, 2006, from <http://www.unlv.edu/main/highlights.html#students>

Van Gestel, T., Baesens, B., & Suykens, J. (2006). Bayesian kernel based classification for financial distress detection. *European Journal of Operational Research*, 172(3), 97-99.

Watkins, E. (2003). How guests choose hotels. *Lodging Hospitality*, 59(2), 36-39.

Yudkowsky, E. (2003). An intuitive explanation of Bayesian reasoning. Retrieved December 12, 2006 from <http://yudkowsky.net/bayes/bayes.html>

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