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Travelers' Most Preferred Green Attributes for a Hotel Room

ABSTRACT

The purpose of this study, based on bundles of select environmentally friendly hotel room attributes, is to identify what kind of green hotel room business and leisure travelers would most prefer. Another purpose of the study is to assess whether customers are willing to pay more, and if so, how much more, to stay in an environmentally friendly hotel room. The hotel room most preferred incorporated a refillable shampoo dispenser, energy efficient light bulbs, and towel and linen policies, as well as key cards, and green hotel certification. Green hotel certification was the most influential attribute on preference. These results contribute to the practical advancement of the hotel industry by providing the green attributes that may be most desirable to guests. This

information can help hotel managers and operators set up their green hotel room accordingly, and also begin to gather information on the cost of creating a room that is made up of the preferred attributes. Further results and implications are discussed.

INTRODUCTION

The state of our environment is put in front of society everyday; whether it is with new terms, scare tactics, or movies. As a result of such marketing efforts, or other efforts in general, the public is becoming increasingly concerned about the environment and how our daily lives impact it. According to the 2008 National Leisure Travel Monitor survey, 85% of leisure travelers consider themselves environmentally conscious (Crocker 2008). In a separate study, 43 million U. S. travelers have expressed their concern for the environment (Vora 2007). In a survey conducted by Deloitte, of 1,155 business travelers surveyed, 34% of them seek out hotels that are environmentally friendly, and 38% have researched green lodging facilities (Clausing 2008). This environmental consciousness is poised to have an affect on the hotel industry as more and more travelers begin to pressure the lodging industry to be more environmentally conscious (Gustin and Weaver 1996). The most recent North America Hotel Guest Satisfaction study (J. D. Power 2009) reinforces this statement. According to the survey, 66% of hotel guests stated that they were aware of their hotel's conservation efforts, compared with 57% in 2008. Of these respondents, 72% said they participated in their hotel's conservation programs.

As compared to other buildings, hotels are considered among the least efficient (Gustin and Weaver 1996) so hoteliers have started incorporating practices that minimize their impact on the environment into their daily operations. For example, some hotels have switched to energy efficient lighting, while others have taken more drastic steps by replacing inefficient HVAC systems, or by reusing water drained from sinks and showers for landscaping purposes. In

addition to incorporating green practices at the general property level, some hotels are now incorporating them into the guest room. Typical green attributes found in the guest room may include low-flow water fixtures, or linen re-use programs.

Despite the fact that hoteliers have begun incorporating green attributes into the room, and that so many travelers consider themselves environmentally conscious, however, it is unknown whether the travelers actually prefer any green attributes in hotel rooms. General attributes of a hotel, such as location and price, are a well-studied phenomenon in the travel and tourism literature (Dolnicar and Otter 2003), but the scope of research about guests' preferences for green hotel attributes is very limited (Kasim 2004). The few studies conducted that do relate to the demand for environmentally friendly hotel attributes have focused on individual attributes, such as a towel reuse program or energy-efficient lighting. However, very limited research, if any, exists on examining these attributes simultaneously, or as a bundle, of environmentally friendly attributes to determine their relative importance in guest preference.

According to The Theory of Consumer Demand (Lancaster 1966), consumers make decisions about a particular product or service based on the attributes that make up, or the characteristics of, the product or service as a whole. In other words, consumers do not prefer one product over another based solely on one characteristic of that product. Instead, they evaluate all attributes as a bundle. Marriott recognized this when developing the Courtyard by Marriott brand. Researchers presented business travelers with bundles of hotel attributes, as well as guest room attributes, in order to identify the ideal hotel and guest room product that was most preferred by business travelers (Wind, Green, Shifflet, and Scarbrough 1989). Business travelers then rated their preference for each bundle, which Marriott then used as a guideline for developing the hotel.

The purpose of this study, based on bundles of select environmentally friendly hotel room attributes, is to identify what kind of green hotel room business and leisure travelers would most prefer. Because there is no clear definition of what, specifically, a green hotel room is, we use the term to mean a room that incorporates environmentally attributes. Another purpose of the study is to assess whether customers are willing to pay more, and if so, how much more, to stay in a green hotel room. Previous research has indicated that business travelers are willing to pay up to 10% more to stay in a green hotel (Clausing 2008), but limited information, if any exists for leisure travelers. The following research questions were herein addressed:

- R1: Which bundle of environmentally friendly hotel attributes will be most preferred by business travelers?
- R2: Which bundle of environmentally friendly hotel attributes will be most preferred by leisure travelers?
- R3: Are these travelers willing to pay more for a green hotel room? If so, how much more?

One of the attributes included in the study is whether or not a hotel is certified as a green hotel. A green certification program provides hoteliers the opportunity to have their hotel rated based on predetermined environmental practices and policies. Programs such as LEED certification, have been gaining in popularity but it is unclear the role these programs play for consumers when they evaluate hotel. Green certification is an attribute that cannot be felt or experienced, but is a type of attribute that can be most influential for consumers when they evaluate a product or service (Aqueveque 2008; Espejel, Fandos, and Flavian 2009; Lee and Lou 1995; Veale and Quester 2009). Therefore, this study will examine the role green certification plays in the overall preference for a green hotel room.

It is essential for hotel managers to understand who their customers are and what they prefer (Lockyer 2002). This is particularly important in the lodging industry because customers evaluate a hotel, not just on one attribute or service the hotel may offer, but on several (Verma and Thompson 1997). Awareness of property-initiated green programs is stated to have a strong impact on overall hotel guest satisfaction (J. D. Power 2009). Guests who report being aware of their hotel's green programs, on average, rate satisfaction more than 160 points higher than guests unaware of them. If hoteliers understand their customer's preferences, they can position their product (the hotel or hotel room) to target customers based on those preferences. It may be impossible for a lodging facility to provide all possible attributes that customers prefer so it is important to at least understand the preferences that are relatively most important to them, and make investments accordingly.

LITERATURE REVIEW

Attributes

While the study of hotel attributes is prominent in the hospitality and tourism literature, only a few studies have been devoted to comparing business and leisure travelers and their preference for certain hotel attributes (Dolnicar 2002; Dolnicar and Otter 2003; Knutson 1988; Lewis 1984a). Room attributes are typically defined as the amenities provided in a room, or the characteristics of the room itself (Dolnicar and Otter 2003). In one of the earliest studies, Lewis (1984b) found significant differences between leisure and business travelers and attributes related to perception of the hotel. Knutson (1988), also comparing business and leisure travelers, found that business travelers were less concerned about price than were leisure travelers, but leisure travelers were more concerned about safety and security issues.

Although there is a plethora of research available about hotel attributes, the research on environmentally friendly hotel and guest room attributes, or if travelers even place importance on them, is limited to a few studies. One such study is that conducted by Watkins (1994), which indicated that frequent travelers would stay in hotels with environmental strategies, but they would not be willing to pay a premium for those rooms. The study reported that some environmentally friendly hotel attributes that travelers may consider when selecting a green hotel included, but were not limited to: recycling bins, energy-efficient lighting, using recycled paper for promotional materials, changing sheets only when requested, and turning off lights in unoccupied guest rooms (Watkins 1994).

Kasim (2004) studied tourists to Penang Island, Malaysia and found that tourists were knowledgeable and cared about the environment but they did not consider a hotel's environmental strategy as a foundation for their hotel choice. That is not to say that they would not approve of room attributes that were environmentally friendly. Tourists were willing to accept rooms with water saving features, recycling bins, fire-safety features, energy saving features, and information on local ecotourism attractions (Kasim 2004).

Intrinsic versus Extrinsic Attributes

When selecting a service or product, customers rely on the attributes or "cues" to help them make a decision (Crane and Clark 1988; Lee and Lou 1995). Cues are defined as "a characteristic, event, quality, or object that is external to the consumer that is encoded and used to categorize a stimulus object" (Crane and Clarke 1988, p. 53). They are also used to help consumers evaluate goods and services, which may significantly influence satisfaction and overall experience. Olson (1977) describes this evaluation process as the "cue utilization process", in which there are two steps. The first step is when the customer selects and stores

information about specific cues about a product or service (Brady, Bourdeau, and Heskell 2005). The second step is when the customer uses these cues to evaluate the product or service (Olson 1977).

Cues are often divided and described as either intrinsic or extrinsic cues (Olson 1977; Olson and Jacoby 1972). Intrinsic cues are those that make up the physical attributes of the product or service, and can sometimes be difficult to change (Brady et al. 2005). If an intrinsic attribute were changed, it would result in a noticeable change in the product or service itself (Szybillo and Jacoby 1974). Intrinsic cues are very specific to a product or service, whereas extrinsic cues are more general and applicable to a wider range of products (Lee and Lou 1995). Extrinsic attributes are the intangible cues of the product, such as price, brand, or image (Olson and Jacoby 1972; Veale and Quester 2009). A change in an extrinsic attribute will not directly affect the physical product or service (Veale and Quester 2009).

A number of studies that distinguish between intrinsic and extrinsic cues, and how they may influence the decision-making process, have been published (Espejel et al. 2009). The literature shows that consumers are typically more familiar with extrinsic cues than with intrinsic cues and thus use the extrinsic cues most often to evaluate a service or product (Aqueveque 2008; Espejel et al. 2009; Lee and Lou 1995; Veale and Quester 2009). In essence, extrinsic cues are the most influential attributes that customers use when evaluating services or products. However, the literature also shows that this process is not universal and will vary based on context and individual differences (Lee and Lou 1995).

Green certification

Hoteliers may seek green certification if they believe they have taken appropriate steps to help reduce their hotel's impact on the environment. Different certification programs provide

different ratings for the hotels to follow. In some instances, the hotel self-reports (also known as first party certification) which environmental practices it participates in and in other instances the certifying organization inspects the hotel. Standards that most certification programs use incorporate those areas of the hotel that relate to energy management, waste management, water use reduction, and education.

Such green certification programs, most commonly referred to as ecolabel programs on a worldwide level, have been gaining in popularity (Fairweather and Maslin 2005). Font (2002) and Synergy (2000) both identified over 100 ecolabel programs for ecotourism, hospitality, and tourism throughout the world. While there appear to be a plethora of ecolabel programs, how consumers react to them is relatively unknown (Reiser and Simmons 2005). Most of the research conducted in relation to ecolabel programs, instead, have focused on what the programs offer and what standards are incorporated into them (Reiser and Simmons 2005; Spittler and Haak 2001; Weaver 2001). In the studies that have assessed how ecolabels influence behavior, results have indicated that they had very minimal influence on a traveler's decision-making process (Sharpley 2001). In fact, the results of several studies have claimed that many tourists are not even aware of the existence of ecolabel programs in many cases (Fairweather and Maslin 2005; Hamele 2002; Wood and Halpenny 2001).

One of the most widely talked about certification programs today is that developed by the United States Green Building Council (USGBC). The USGBC has developed the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. LEED "promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality" (USGBC 2008, ¶ 2). Certification is

achieved at four different levels (certified, silver, gold and platinum) and assesses building design that incorporates, for example, the use of recycled materials in constructing the hotel. At present, there are only seven LEED certified hotels in the world (Garrett 2008). The program is voluntary, as are the other programs, and is quite costly (Jennings 2007). As a result, some establishments have decided to adhere to LEED standards without spending the money to apply for certification (Jennings).

METHODS

Conjoint Analysis

Conjoint analysis (CA) is a research tool that academic and industry professionals use to understand the bundle of attributes that are important to consumers when they purchase a product or service. It measures the degree of importance of each product attribute and its influence on the consumer's choice of the overall product (Lewis, Ding, and Geschke 1991). It is also a technique that enables marketing managers to identify specific characteristics and how they can be bundled in such a way as to attract the most buyers; it has become one of the most widely used research tools in the marketing field (Orme 2006). Green and Rao (1971) argued that conjoint analysis could potentially help managers understand buyer preferences. It was first referenced in 1964 by the psychologist Luce, and statistician Tukey (Green and Srinivasan 1978; Orme 2006). They presented the idea that a method such as conjoint analysis could be used as a research tool in the behavioral sciences in order to help answer the question of how two independent variables contribute independently to an over-all effect or response (Luce and Tukey 1964).

Conjoint analysis is one of the many methods used to understand tourist preferences in the tourism industry (Apostolakis and Jaffry 2005; Feather, Hellerstein, and Tomais 1995; Lewis,

Ding, and Geschke 1991; Limburg 1998; Lindberg, Dellaert, and Rassing 1999; Louviere and Woodworth 1983; Thyne, Lawson, and Todd 2006). It has also been used in the meetings and events industry (Hu and Hiemstra 1996; Renaghan and Kay 1987) as well as the food and beverage industry (Dube, Renaghan and Miller 1994; Koo, Tao and Yeung 1999; Verma and Thompson 1996; Verma, Thompson, and Louviere 1999).

While choice modeling methodologies appear in the hospitality literature in general, however, they are not as prominent in hotel literature. In one of the more well-known studies, Wind et al. (1989) helped Marriott Corporation design a new hotel chain. The conjoint process enabled Marriott to identify a specific target market (business travelers), and the physical attributes and hotel layout that the target market preferred. By surveying business travelers, Wind et al. (1989) were able to identify the bundle of specific hotel attributes that the travelers preferred which, in turn, enabled Marriott to develop a new hotel product that catered to the business traveler market. The end result was the development of *Courtyard by Marriott*, which is now a successful, well-known hotel product for Marriott.

The theoretical framework for traditional conjoint analysis lies in Lancaster's (1966) theory of consumer demand. Lancaster (1971) argued that traditional demand theory only identified the effect of a change in price on the demand for a good. It provided no way of identifying the effect of changes in the physical properties (characteristics) of the goods on demand or preference. It is the physical properties of goods that fulfill consumer's needs and wants (Lancaster 1971). Consumers gain utility from the characteristics of the good, not from the good itself:

Goods are considered not as entities in a gestalt sense but as bundles of properties or characteristics. The characteristics are objective, and the relationship between a good and the

characteristics it possesses is a technical one, determined by the design of the good or by “nature” if the good is not yet synthesized. Individuals are interested in goods not for their own sake, but because of the characteristics they possess. (Lancaster 1979 p. 17)

The study was designed as a conjoint choice experiment by presenting potential travelers with hypothetical scenarios that incorporated different bundles of environmentally friendly room characteristics. The travelers then rated their preference for each room incorporating these attributes. The scenario with the highest rating represented the room with the most preferred attributes.

Selection of Attributes

One of the first steps in conjoint analysis is to identify the attributes that will be used in the hypothetical scenarios. The environmentally friendly attributes in the present study stemmed not only from the aforementioned studies (Kasim 2004; Watkins 199), but also from results of a pilot study conducted with hotel developers (Millar & Baloglu, 2008). There are seven attributes in total, which two levels for each of them. For example, the first attribute’s two levels (recycling policy) were recycling bin in the guest room, or a recycling bin in the hotel lobby. A hotel guest, on average, produces one to two pounds of waste on non-checkout days, with that amount doubling on checkout days. Providing guests with the option to recycle some of their waste gives hoteliers the opportunity to save on waste disposal costs.

The second environmentally friendly attribute, shampoo amenities included an individual bottle; and, refillable dispenser in the guest bathroom. Bathroom amenities in hotels generate much waste in the industry (Burger, 2007). The use of refillable dispensers helps to reduce the waste by using the dispensers for soap and shampoo instead of individual plastic bottles that are thrown into the landfill. Controlled lighting is the third attribute. There are several solutions to

controlling lighting, or power in general, to a room. Two of the most commonly cited are occupancy sensors in the room (level one of the attribute controlled lighting) and key cards that turn all power to a room on and off (level two of the attribute controlled lighting). Because lighting is such a large use of energy, energy efficient light bulbs are the fourth attribute.

The fifth and sixth attributes are a towel policy, introduced at two levels – a towel-reuse program, or fresh towels – and a linen policy, also introduced at two levels – sheets changed daily, or sheets changed upon request only for stays up to three nights. Towel re-use programs are the most popular eco-friendly activity undertaken by hoteliers today. In a recent study conducted by the AHLA, 83.5 % of hotels surveyed had a towel re-use program and 88% had a linen re-use program in place (Johnson, 2008). The final attribute is green certification for the hotel. To help consumers identify green hotels, and the practices they incorporate, hotels may either seek green certification, or join a green association.

In summary, the final attributes, each with two levels, were recycling policy (RP), shampoo amenities (SA), controlled lighting (CL), energy efficient light bulbs (EEB), towel policy (TP), linen policy (LP), and green certification (GC). The attributes are comprised of both environmentally friendly ones, along with some attributes not considered environmentally friendly. They are all, however, attributes that hotels currently provide. Including these attributes in this study enables managers to understand how far they can carry the green concept throughout a hotel room. A summary of the attributes and their corresponding levels is presented in Table 1.

<Insert Table 1 here>

Scenarios

Similar to the Wind et al. (1989) study, we presented respondents to our survey with “scenarios” for which they rated their preference for it using a scale of 0 (not at all preferred) to 10 (extremely preferred). This scale is the recommended scale for ratings based conjoint studies, and is the one used most often in previous literature (Hair, Black, Babin, Anderson, and Tatham 2006; Orme 2006). Each scenario consisted of a hypothetical hotel room that incorporated all of the attributes, but not all levels of the attributes, included in the study. An example of a scenario is shown in Table 2:

<Insert Table 2 Here>

An important step in CA is determining the actual number of scenarios that should be included in the study. The number of possible scenarios in this study, using a full factorial design, is 128 (2^7), based on the seven attributes (RP, SA, CL, EEB, TP, LP, GC), each with two levels. However, requiring respondents to rate 128 hypothetical scenarios will take too much time and most likely result in survey fatigue. Another approach to producing a statistically adequate number of scenarios is to conduct a fractional factorial design, which is an alternative to a full factorial design. The fractional factorial design reduces the number of scenarios to be evaluated; while at the same time maintains orthogonality. Orthogonality insures that there are no correlations among the different levels of each attribute, and that each level of each attribute appears the same number of times throughout the scenarios (Hair et al. 2006). A fractional factorial design for this study was created using SPSS Conjoint 17.0. Each factor (attribute) was entered, along with its corresponding level, in order to build the design and generate the scenarios. The fractional design produced eight scenarios. Based on the formula recommended by Xu and Yuan (2001), however, eight scenarios are not enough scenarios to produce valid conjoint results. If respondents rated their preference for only eight scenarios the overall results

would not provide any valuable insight, nor would they be valid. Instead, Xu and Yuan (2001) suggest that the number of scenarios equals at least 1.5 times the number of parameters. The number of parameters is determined by the formula $n(k - 1) + 1$ where n = the number of attributes, and k = the number of levels for each attribute. With seven attributes having two levels each in this study there would be eight parameters ($7(2 - 1) + 1 = 8$), and thus, 12 scenarios ($1.5 * 8$). Therefore, 12 scenarios were produced and used.

Sample

The targeted sample for this survey were travelers, business or leisure, who had spent at least one night in a hotel in the previous 12 months, and who indicated that they were willing to stay in an environmentally friendly hotel. In total, 606 travelers completed the survey. The final mix included 305 business traveler respondents, and 301 leisure traveler respondents.

Data Collection

The conjoint experiment was administered via an online survey. Travelers were randomly selected using an extensive database provided by an online research company. The company organizes, creates, administers, and analyzes surveys for both universities and the business industry. Participants were recruited for this survey from the database of nearly 4 million consumers and business panels that are representative of the U. S. population. Members of its panels have already agreed to be contacted for survey participation. An introductory email was sent to the panel members in search of people that have stayed in hotels while traveling for either business or leisure purposes. Different surveys were created for business and leisure travelers. The differences between the two surveys were subtle but this step ensured that respondents

consistently answered the questions from either a business traveler or leisure traveler's point of view.

Data Analysis

Frequencies, means and standards deviations were run for all demographic data. We used CA to identify both the combination of attributes most preferred by the travelers, and the most influential attribute on preference. We adopted the traditional, full-profile conjoint method for this study because of the relatively small number of attributes. It is known as the full-profile method because all attributes, albeit at different levels, are included in each scenario. The conjoint analysis itself involves methods similar to regression analysis (SPSS 2007). The procedure produces utility scores, which are more commonly referred to as part-worths, for each attribute level (i.e. fresh towels or occupancy sensors). Utility "represents the total worth or overall preference of an object and can be thought of as the sum of what the product parts are worth" (Hair et al. 2006 p. 467). The part-worths are similar to coefficients in multiple regression in that each part-worth value represents the "desirability" of that particular attribute level. A positive value represents preference for the attribute level, while a negative value indicates no preference. There will be 14 utility scores for 14 attribute levels (7 attributes with 2 levels each).

ANALYSIS AND RESULTS

Before running any statistical analysis of the responses, the data were scrutinized for any irregularities, missing data, or unrealistic responses, especially in relation to the scenarios that the respondents were asked to rate. The business traveler data yielded 21 cases where the respondent rated every scenario exactly the same. To enhance the validity of the overall preference structure, those cases were deleted (Hair et al. 2006). Seventeen cases were deleted

from the leisure traveler responses for the same reason. In total, 284 business traveler responses and 287 leisure traveler responses were deemed useful for the final analyses in this study.

Demographic Profile

Of the 284 responses received from the business travelers, 119 (41.9%) of them were from women (for a summary of demographic results, see Table 3). The age of the respondents was fairly even. Twenty three percent of the respondents were 29 years old or younger, 23% were 30-39 years old, 29% were 40-49 years old, and 26% were 50 or older. Roughly half of the respondents (47%) earned an income of \$55,000 or less, with the most (31%) earning between \$35,001 and \$55,000. Thirteen percent of the respondents had a high school education or less. Thirty one percent had some college, while 15% had earned an associates degree, 29% a bachelors degree, and 12% a graduate degree or higher. Over half (59%) of the business travelers indicated that they were married.

<Insert Table 3 Here>

Fifty-six percent of the leisure traveler respondents ($n = 287$) were female. Most respondents were age 50 and older (31%). Twenty five percent were between 40 and 49, while 24% were between 30 and 39 (for a summary of leisure demographics, see Table 6). More than half (54%) of the leisure travelers' household income was \$55,000 or less. Education level varied among the respondents. Twenty four percent had a high school education or less, while 35% had some college. Only 13% of the respondents had an Associates degree, but 20% did have a Bachelor's degree. Most respondents were married (61%).

These demographic results were compared to those of the general population of both business and leisure travelers in order to gain an understanding of how representative the study sample was. According to the American Hotel and Lodging Associations (AHLA) Lodging

Industry profile (2007), 65% of business travelers are male, age 35-54, earning a household income of \$85,900. In this study, 58% of the business traveler respondents were male with most of them about 35 and older. Most of the male survey respondents also earned an annual household income that was less than \$75,000.

Comparisons of the leisure travel respondents to leisure travelers in general is more difficult as there are no clear statistics that represent the entire leisure travel population.

The AHLA (2007) does indicate that two adults between the ages of 35 and 54 typically make up one leisure night in a hotel, and earn an annual household income of \$77,100. Although the age distribution is similar to that of this study, annual household income is not.

The gender demographic characteristics of leisure travelers were compared to the U. S. population in general using the most recent U. S. Census Bureau's statistics, which are from 2000. At that time, 51% of the population was female. In this study, 57% of the leisure traveler population is female.

A comparison of other demographic variables, such as education and marital status, for both groups was also made using the U. S. Census Bureau data since nothing of that nature exists specifically for either type of traveler. The majority of the respondents had an associate's degree or less, which is in line with the U. S. population. In addition, most respondents had attended college but had not obtained a degree, which also corresponds well with the U. S. overall population (U. S. Census Bureau, 2000). Slightly more than half of the U. S. population is married, as was the case in this study.

In summary, the sample in this study is representative of the U.S. travel population because it is fairly consistent with U. S. census data for 2000, and data from AHLA. It is noted, however,

that these results still cannot be generalized to the overall population of business and leisure travelers.

Conjoint Analysis Results

To test the goodness of fit for the conjoint model, the Pearson's R statistic was calculated for both business and leisure travelers as a group, and for each individual respondent. Pearson's R measures the correlation between observed and estimated preferences (SPSS 2007). It was 0.99 for the business travelers and 0.98 for the leisure travelers, indicating a very good fit (Hair et al. 2006). High Pearson's R statistics are not uncommon in conjoint studies if the number of scenarios rated (12 in this case) is close to the number of parameters rated (in this case, seven). Even though the goodness of fit is high for both groups, it is also recommended that the same statistic be computed for each respondent in order to measure the consistency with which respondents rate their scenarios (Moskowitz, Beckley, Mascuch, Adams, Sendors, and Keeling 2002; Orme 2006; Soutar and Ridley 2008). An issue with conjoint studies is that respondents may not take the tasks seriously. As a result, their answers may not be of quality, and thus, reliability is compromised (Moskowitz et al. 2002). An individual response with a Pearson's R of 0.50 or lower is typically eliminated from further conjoint analysis (Moskowitz et al.). Pearson's R was significant for all individual cases at a level of 0.60 or higher for both groups. As a result, no cases were eliminated based on the Pearson's R.

Each attribute has two levels and thus, two resulting part-worth scores. The part-worth scores are presented in Table 4. The attribute level with the positive part-worth score is the attribute level most preferred by all of the respondents in each group. For example, of the recycling policy, business traveler respondents preferred to have a recycling bin in the hotel lobby (part-worth is equal to 0.062) as opposed to having one in the hotel room (part-worth is

equal to -0.062). Leisure travelers had the same preference although the actual part-worth scores were different (0.026 and -0.026, respectively). While the business traveler's part-worth scores for each attribute are different from those of the leisure travelers, the overall preference for the hotel room attributes is the same for both travelers. Based on these positive part-worth scores, business and leisure travelers most prefer a room without a recycling bin, but with a refillable shampoo dispenser, a key card that controls power to the room, energy efficient light bulbs, a towel re-use policy, sheets changed upon request only, and is green certified.

<Insert Table 4 Here>

The CA results also produced a score for the relative preference of each attribute. Each score represents the "relative impact each attribute has in the calculation of the overall preference" (Hair et al. 2006 p. 539). Attributes with the greatest ranges in preference, or the highest relative preference score, are the most influential on overall preference. In essence, the relative preference of each attribute explains the extent to which each attribute makes a difference in the overall preference for the hotel room. Green certification, with the highest score, was the most influential attribute on overall preference for both leisure and business travelers. Relative attribute scores are presented in Table 5.

<Insert Table 5 Here>

Price Sensitivity

Eighteen percent of the business travelers indicated that they were willing to pay more when staying in a green hotel, versus only 9.8% of leisure travelers. Of the business travelers willing to pay more, 51% of them were willing to pay 10% more for a room. The results were similar for leisure travelers. Some travelers believed they should actually pay less for a green hotel room – 4.6% of business travelers, and 6.3% of leisure travelers. Within both groups, however, the

majority believed there should be no price difference between a green lodging property and a traditional property with 77.5% of business travelers and 84% of leisure travelers indicating so.

Table 6 provides a summary of the results.

<Insert Table 6 Here>

DISCUSSION

As findings indicated, the preferred bundle was essentially the same for business as it was for leisure travelers. The hotel room most preferred incorporated a refillable shampoo dispenser, energy efficient light bulbs, and towel and linen policies, as well as key cards, and green hotel certification. Respondents were not in favor of having a recycling bin in the hotel room, but instead preferred to have one in the hotel lobby. Green certification, and extrinsic attribute with an importance of 17.51 for business travelers and 16.83 for leisure travelers, was the most influential attribute on overall preference for the environmentally friendly hotel room. Although previous hospitality research has not studied the influence specifically of green certification on travelers, the results are consistent with other studies that have assessed the extent to which other extrinsic attributes, such as price or brand, influence the traveler's decision-making process. The results also add to the body of literature related to hospitality consumer behavior theory, in particular in regards to the influence of different types of attributes – namely extrinsic or intrinsic – on behavior. The role of extrinsic variables versus intrinsic variables on the decision making process for travelers is relatively untouched territory, especially in relation to hotels. Understanding how important and influential these two types of attributes are can help hoteliers to highlight specific hotel characteristics as part of marketing campaigns.

The fact that green certification was the most influential attribute in overall preference is encouraging because, in the past, consumers tended to be skeptical of eco-labels (Carlson,

Grove, Laczniak, and Kangun 1996; Clemenz 2010; Crane 2000; Davis 1993; Furlow and Knott 2009; Karna, Juslin, Ahoven and Hansen 2001; Laroche, Bergeron and Barbaro-Forleo 2001; Polonsky, Carlson, Grove, Kangun 1997). The preference may indicate a desire for some sort of regulation in the industry, or at least something that gives potential hotel guests a clear picture of what constitutes a green hotel. If the hospitality industry were to create a label that is straightforward, easy to understand, and truthful, the skepticism can be minimized. Such a label can provide guests with a base-line idea of what a green hotel offers, and what to expect when staying at one. Green certification labels communicate to guests, and, at the same time, educates them about the green hotel industry.

In addition, the label is a way for managers across the industry to create and set standards for all hotels that want to be a little friendlier to the environment. It gives them a blueprint to follow. Currently there is no uniform rating system in the United States that hoteliers can follow and this presents a challenge to the industry (Withiam 2010). There has been much discussion over the past couple of years about creating such a program for the industry, but nothing as yet has been done. Hoteliers would need to take care about how they use the green certification in advertising materials because the success of similar eco-label programs in other industries has been mixed. They do want to avoid greenwashing, which can be a deterrent to potential guests. It can be costly, though, for a hotel to seek any sort of green certification and it is relatively unknown if there are any benefits to spending the money to do so. However, if there is an indication that such a green label is important to hotel guests, managers may see that as a reasonable benefit.

Preference for some of the attributes over others is not surprising. Towel and linen policies are part of many hotel policies today, and customers are used to having them. Also, the use of

energy efficient light bulbs, while hotel guests may not realize it, is also common practice today; in addition it is an activity that many travelers partake in at home. The use of occupancy sensors or key cards that help to control power and lighting in a hotel room, however, is not as common a practice as is incorporating some of the other green attributes. It is understandable that guests would most prefer the key card because the key card gives them control over their room.

Occupancy sensors, however, are controlled by motion, and there is no way for the hotel guest to turn the sensor on or off. On the other hand, from management's perspective, occupancy sensors can easily be adapted to existing lighting fixtures, whereas key cards are expensive and not easily installed in already-established hotels. It is easier for brand new hotels to install key cards when building a property from the ground-up. Although key cards were preferred over occupancy sensors, it is not to say that guests would not accept them in a hotel. A hotelier, as a less expensive alternative to control energy usage by guests, may decide to try occupancy sensors to test the waters, so to speak, and gauge guest reaction to them.

Preference for the shampoo dispenser over individual bottles is unexpected. Results of previous studies that have only assessed importance of individual attributes, not bundles of attributes, found refillable shampoo dispensers an unpopular green attribute (Kasim 2004; Watkins 1994). Dispensers are commonly used in Europe and Asia, but are not so well received in the U. S. Guests are often concerned with cleanliness of the dispensers, and are hesitant to use a dispenser without knowing for certain what is in it. Hoteliers have also been hesitant to use dispensers because it is difficult to find ones that fit with hotel décor, or are otherwise visually appealing. Having said all of that, based on the travelers in this study, guests may be more open to dispensers than previously thought. Perhaps hoteliers could take advantage of this opportunity by experimenting with dispensers filled with, for example a branded product. There is a cost

savings too for use of dispensers because product waste is reduced and housekeeping staff does not need to replace the products daily. One hotelier that does use dispensers explains:

Now we don't have to collect and throw out all of those little plastic bathroom amenity bottles, which tend to waste money and our housekeepers' time, as well as take up space in our landfills. . . Now our guests can use as much of whichever bathroom amenities they desire – while we save \$6,000-plus-per-year, which goes directly to our bottom line. (Burger 2003 p. 2)

Respondents to previous studies had indicated they would be willing to have a recycling bin in the guest room (Kasim 2004; Watkins 1994), whereas respondents in this study preferred one in the hotel lobby. This finding actually presents hoteliers with an opportunity. The respondents, by selecting the bin in the lobby, are saying they do not want to be bothered with separating their trash in the hotel room. In today's economic environment, every opportunity a hotelier has to save money should be taken. The expense of placing a recycling bin in every room of a hotel can be quite high and the logistics of collecting recyclables from each room can be difficult. The housekeeping staff's carts are already quite full with supplies, with little room left for cans or newspapers. If housekeeping does not collect the recyclables from the rooms, someone else on the staff must be charged with doing so, thus creating other expenses with time and resources. Collecting recyclables from hotel lobby bins, however, would be much more efficient and use fewer resources, and it gives the guest what they do not want – to separate trash in their hotel room.

Looking back to the beginning of the study, we wished we had added two more levels to the recycling policy attribute – hotel recycles in the back of the house, and hotel does not recycle. The preference for this attribute may have differed as a result. Several larger hotel properties

separate trash and recycle in the back of the house, thus eliminating the need for guests to do so in either their room or the hotel lobby. Hoteliers communicate this information via posters in the lobby, or literature in the hotel room. Essentially, hoteliers emphasize that they do the recycling for the guest so the guest does not have to worry about it. Had this option been presented to the respondents in this study, it may have proven more popular than the bin in the lobby. In addition, some hotels may not recycle at all. Since we did not present that option, we may not have a crystal clear picture of the importance of recycling to travelers, which is a limitation of this study.

Contrary to results of previous research, respondents in this study believed a green hotel room should not be priced differently than one that is not green. This is important for hoteliers to understand. There is a perception that a green hotel costs more to stay at than a non-green hotel. That perception may be driving potential guests away from a green hotel. A successful green hotelier will recognize this and price rooms accordingly and competitively. Although most do not wish to pay more for a green room, there are some that would. Business travelers in particular agreed to pay higher rates more so than leisure travelers. Because business travelers typically do not pay for their own accommodations, they may be less sensitive to price than the leisure traveler, thus explaining the willingness to pay more. The travelers willing to pay less for the green room may recognize that many green attributes are also cost-saving measures for the hotelier – cost savings that could be passed on to the hotel guest.

Finally, previous literature claims that business travelers might have more concern for the environment than do leisure travelers. The two groups, however, were fairly homogeneous in this study. Both groups had the same preference for the green attributes incorporated into a hotel room, and both groups placed the most importance on green certification. Business and leisure

travelers are often targeted by different types of hotels, which is to be expected, and is understandable. The results of this study, at least for hotels offering an environmentally friendly product, suggest that hoteliers do not need to differentiate between the two types of travelers when marketing their green product. Instead, they may target both groups, both of which had already expressed interest in staying in a green hotel, with similar campaigns instead of trying to create different campaigns for each type of traveler. This suggests also that any type of hotel, whether leisure or business oriented, can incorporate green policies, or at least the environmentally friendly room attributes identified in this study, and please both types of travelers.

Implications for Future Research

Despite the fact that hotels have begun incorporating green policies into their management practices, and it appears that hotel guests seek such policies, there is a dearth of research about the subject in the hospitality arena. As a result, there are many opportunities for future research. One is to see how these results differed from similar studies conducted for specific hotel categories (i.e. economy versus upscale), food and beverage establishments, both within hotels and stand-alone facilities, and the meetings and event industry. Another is to gain a better understanding of the supply side of green hotel attributes, such as what hotel management thinks about environmentally friendly hotels, to what extent they are incorporating environmental policies into their company culture, and why. The same type of research with the employees of a lodging facility would also prove interesting.

Although there are a number of green attributes that were not included in this study, the ones that were included provide future researchers with a preliminary list that can be used to validate other research efforts. There are also many other attributes that may be incorporated into the

hotel property as whole. Research needs to be done to explore how other attributes, both individually and as a bundle, and both green and not, may influence preference for a hotel.

While willingness to pay for an environmentally friendly hotel was assessed, exact pricing for green hotels was not because there was no clear formula for computing different price levels that could be included in the scenarios. In addition, price will vary with different hotel types (i.e., luxury versus mid-scale). Several studies in the marketing literature have assessed willingness to pay for organic grocery items, but prices in that case are very straightforward to compute as compared to the hotel industry. More research in the hotel industry will clarify how price may influence a traveler's preference for an environmentally friendly hotel.

Green hotel certification has been a relatively untouched research topic in the hospitality literature, so it is difficult to compare the results of this study with others. It is encouraging, however, that travelers wish to see this certification. The role of such labels in hospitality needs to be explored further. Although customers may indicate that they want some sort of certification, the type and influence of different certification labels is virtually unknown in the hospitality industry.

Future research that seeks understanding of the green hotel consumer, and the green hotelier, should also assess environmental attitudes, personal values and how they may influence green hotel preference, or green hotel operations. In addition, future studies could focus on the affect of green hotel attributes on actual hotel selection, as well as guest satisfaction.

Limitations

As with most studies, there are limitations to this study that must be discussed. One of the most difficult tasks involved with conjoint studies is the selection of the attributes used in each scenario or profile. Although measures were taken to ensure that the chosen attributes were

realistic and important, the list was not exhaustive. There are many attributes that pertain to the décor of a room (e.g., organic linens, or chemical-free paint) and to a hotel property as a whole (e.g., efficient heating, ventilation, and cooling systems, or reclaimed water systems) that might be of importance to some hotel guests but were not incorporated into the study. In addition, the scenarios may have had some attributes that were unfamiliar to the respondents.

When deciding which hotel to stay at, potential guests base their decision on more than just the seven attributes incorporated into this dissertation. At the same time, if more attributes had been involved in the scenarios, respondents may have the problem of information overload (Green and Srinivasan 1978; Hu and Hiemstra 1996). To avoid information overload, the number of attributes and attribute levels was limited.

Social desirability bias also presents a potential limitation. The propensity to achieve social desirability may be a strong influence on the results of a self-report questionnaire (Ones, Viswesvaran, and Reiss 1996). Even though anonymity was ensured during the survey process, there was a lack of control over the participants' desire to respond the way they think they should as opposed to responding with their true beliefs. In addition, to reduce the potential affect of social desirability bias, respondents to the survey were asked what types of environmentally friendly activities they perform at home. There was a large variance in the survey responses.

Lastly, the sample included only business and leisure travelers that indicated they were willing to stay in an environmentally friendly lodging facility. This limits the extent to which the results can be generalized to the entire population of business and leisure travelers. Even though some travelers may not be willing to stay in such a hotel, it does not mean they do not have pertinent opinions about the type of attributes that may be incorporated into an environmentally friendly hotel.

CONCLUSION

The primary purpose of this study was to identify the type of green hotel room that guests prefer. With the use of conjoint analysis and the attributes incorporated into this study (recycling policy, green certification, towel re-use policy, linen policy, energy efficient light bulbs, occupancy sensors, and key cards), hypothetical hotel rooms, in the form of scenarios, were created that included a combination of each attribute level. Based on the respondents' ratings of each scenario, an environmentally friendly room incorporating the most desirable combination of green features was produced. These results contribute to the practical advancement of the hotel industry by providing the green attributes that may be most desirable to guests. This information can help hotel managers and operators set up their green hotel room accordingly, and also begin to gather information on the cost of creating a room that is made up of those preferred attributes.

Preferences for the attributes differed based on whether the attributes were intrinsic or extrinsic in nature. The extrinsic attribute, green certification, was the most influential attribute overall on preference for the room. These results contribute to consumer behavior literature and theory in the hospitality industry by recognizing the importance and difference of intrinsic and extrinsic attributes, and their influence in the decision making process for hotel guests.

Table 1
Selected Environmentally Friendly Attributes and Attribute Level

Attribute	Attribute Level	
Recycling Policy (RP)	Recycling bin in guest room	Recycling bin in hotel lobby
Shampoo Amenities (SA)	Individual bottle of shampoo	Refillable dispenser of shampoo
Controlled Lighting (CL)	Occupancy sensors	Key cards that turn power to the room on and off
Energy Efficient Light Bulbs (EEB)	Yes	No
Towel Policy (TP)	Fresh towels daily	Towel reuse policy
Linen Policy (LP)	Sheets changed every night during stay	Sheets changed upon request only for multiple night stays
Green Certification (GC)	Yes	No

Table 2
Example of a Scenario

Room 1:
 Recycling bins in the hotel lobby

 Individual bottle of shampoo

 Occupancy sensors to control lighting in the room

 No energy efficient light bulbs in the guestroom

 Towel reuse policy

 Sheets changed upon request only

 Hotel is NOT certified as a green hotel

Table 3
Demographic Profile of Travelers

Demographic Category		Business Travelers n = 284		Leisure Travelers n = 287	
		Number	%	Number	%
Age	29 or younger	64	22.5	56	19.5
	30-39 years old	65	22.9	68	23.7
	40-49 years old	82	28.9	73	25.4
	50 or older	73	25.7	90	31.4
	Total	284	100.0	287	100.0
Gender	Male	165	58.1	124	43.2
	Female	119	41.9	163	56.8
	Total	284	100.0	287	100.0
Education Level	High School or less	37	13.0	68	23.7
	Some college	89	31.3	100	34.8
	Associates degree	42	14.8	37	12.9
	Bachelors degree	83	29.2	58	20.2
	Graduate degree or higher	33	11.6	24	8.4
	Total	284	100.0	287	100.0
Household Income	<\$35,000	47	16.5	82	28.6
	\$35,001 - \$55,000	88	31.0	72	25.1
	\$55,001 - \$75,000	68	23.9	62	21.6
	\$75,001 - \$95,000	44	15.5	32	11.1
	> \$95,000	37	13.0	39	13.6
	Total	284	100.0	287	100.0
Marital Status	Married	167	58.8	175	61.0
	Single	62	21.8	67	23.3
	Widowed, divorced, separated	55	19.4	45	15.7
	Total	284	100.0	287	100.0

Table 4
Part-Worth Utility Scores for Each Attribute Level

Attributes levels	Business Travelers	Leisure Travelers
	Part-Worth Score	Part-Worth Score
Recycling bin in hotel lobby	.062	.026
Recycling bin in guest room	-.062	-.026
Individual bottle of shampoo	-.154	-.114
Refillable shampoo dispenser	.154	.114
Occupancy sensor	-.041	-.060
Key card to turn power to the room on and off	.041	.060
Energy efficient light bulbs in the guest room	.277	.278
No energy efficient light bulbs in the guest room	-.277	-.278
Fresh towels daily	-.172	-.192
Towel re-use policy	.172	.192
Sheets changed daily	-.243	-.226
Sheets changed upon request for stays up to 3 nights	.243	.226
Hotel is certified as a green hotel	.423	.343
Hotel is not certified as a green hotel	-.423	-.343

Table 5
Relative Attribute Importance Scores

Attributes	Business Travelers		Leisure Travelers	
	Importance Score	Rank	Importance Score	Rank
Recycling Policy	11.15	6	10.63	7
Shampoo Amenities	14.82	4	14.09	5
Controlled Lighting	10.75	7	12.35	6
Energy efficient light bulbs	14.81	5	14.73	4
Towel Policy	15.31	3	15.78	2
Linen Policy	15.65	2	15.60	3
Green Certification	17.51	1	16.83	1
Total	100.00		100.00	

Table 6
Travelers' Price Sensitivity Towards a Green Hotel

		Business Travelers		Leisure Travelers	
		Frequency	%	Frequency	%
I am willing to pay _____ than I otherwise would to stay in a green lodging property	Less	13	4.6	18	6.3
	Same	220	77.5	241	84.0
	More	51	18.0	28	9.8
	Total	284	100.0	287	100.0
How much less?	5%	1	7.7	5	27.8
	10%	4	30.8	5	27.8
	15%	8	61.5	8	44.4
	Total	13	100.0	18	100.0
How much more?	5%	17	33.3	10	35.7
	10%	26	51.0	14	50.0
	15%	8	15.7	4	14.3
	Total	51	100.0	28	100.0

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