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## A Choice model approach to business and leisure traveler's preferences for green hotel attributes

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A CHOICE MODEL APPROACH TO BUSINESS & LEISURE TRAVELER'S  
PREFERENCES FOR GREEN HOTEL ATTRIBUTES

by

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A dissertation submitted in partial fulfillment  
of the requirements for the

**Doctor of Philosophy Degree in Hospitality Administration**  
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**May 2009**

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**Dissertation Approval**  
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A Choice Model Approach to Business & Leisure Traveler's

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## ABSTRACT

### **A Choice Model Approach to Business and Leisure Traveler's Preferences for Green Hotel Attributes**

by

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Professor of Tourism and Convention  
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There has been an increase in environmental concern by travelers in the United States (U. S.). As a result, hospitality companies are taking note and have begun to incorporate environmentally friendly or green practices into their operations. What remains relatively unclear, though, is if the increase in environmental consciousness has translated into a demand for environmentally friendly tourism products, such as hotels. There are a few studies related to the demand for environmentally friendly hotel attributes, but none of them have looked at a bundle of environmentally friendly attributes and how customers would react to a hotel room incorporating not one, but several of them.

The purpose of this study, based on bundles of environmentally friendly hotel room attributes, was to identify both the type of environmentally friendly hotel room that business and leisure travelers most prefer, and the characteristics of the traveler who prefers such a room.



This study was designed as a conjoint choice experiment, which measures variation in behavior by presenting customers with hypothetical scenarios that incorporate various product characteristics and asking them to rank each scenario based on their preference. In this study, the scenarios were hypothetical hotel rooms that incorporated various bundles of green attributes. The scenarios, along with demographic and attitude questions, were presented to the survey sample using an online survey company.

The most preferred room was one that incorporated towel and linen policies, a refillable shampoo dispenser, a key card that controls power to the room, energy efficient light bulbs, was green certified, but did not have a recycling bin. Environmental attitudes and the number of environmentally friendly activities the respondents performed at home identified significant differences in the type of traveler that prefers the environmentally friendly room. Other demographic variables were not significant in this study.

Understanding which combination of attributes is preferred over the other gives a clearer picture to hotel managers and developers of what specific combination of green attributes guests would like to see in a hotel room. Hotel managers can use this information to develop specific marketing campaigns geared towards their green consumers. Future research, implications, and limitations of the study are discussed.

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I am the first in my family to have gone to college so they think I am a bit crazy for pursuing a PhD! Their understanding, though, has been tremendous, and their enthusiasm is infectious. I thank them very much for that.

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## CHAPTER I

### INTRODUCTION

As compared to other buildings, hotels are considered among the least efficient “because of their use of disposable amenities and products, heated pools, great amounts of daily laundering, and a number of other factors which impact the environment” (Gustin & Weaver, 1996, p. 2). Hospitality companies are taking note of this and have begun to incorporate environmentally friendly or green practices into their operations in order to make their buildings more efficient. For example, while some hotels have switched to energy efficient lighting, others have taken more drastic steps by replacing old, 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 itself. Typical green attributes found in the guest room may include low-flow water fixtures, or more commonly, linen re-use programs. Some hotels incorporate these practices because they have proven to be cost saving methods, while others incorporate them because they truly believe such measures will reduce the hotel’s impact on the environment. Regardless of the motive, what remains relatively unclear is whether there is a demand for environmentally friendly

tourism products, such as hotels. The research into how or if environmental attributes play a role in a travelers decision to book a particular hotel is very limited (Kasim, 2004). Attributes that are most important to travelers when demanding a hotel in general, however, are a well-studied phenomenon in the hospitality literature (Lockyer, 2005). Location, price, and cleanliness are three of the most important attributes to most all travelers (Dolnicar & Otter, 2003; Shanka & Taylor, 2003).

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, or they have focused solely on one type of traveler (i.e., leisure travelers). None of them have looked at a bundle of environmentally friendly attributes and how customers would react to a hotel room incorporating not one, but several of them. According to *The Theory of Consumer Demand* (Lancaster, 1966), consumers make decisions about whether or not to buy a particular product or service based on the attributes that make up, or the characteristics of, the product or service. When developing the Courtyard by Marriott brand, researchers presented business travelers with bundles of general hotel attributes, as well as guest room attributes, in order to identify the ideal hotel and guest room product for business travelers (Wind, Green, Shifflet, & Scarbrough, 1989). To the researcher's knowledge, such a study incorporating environmentally friendly attributes has not been conducted, nor has there been a study comparing types of travelers.

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, p. 22). 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 & Weaver, 1996, p. 2).

Consumer behavior studies, because of the consumer’s increase in concern for the environment, have begun to analyze how such concern may affect or influence the consumers’ behavior in the marketplace. Concern has lead many consumers to realize that their purchases of products or services may have an impact on the environment, and they are thus making purchases with this in mind. Known as green consumers, they are typically “female, pre-middle aged, with a high level of education (finished high school) and above average socioeconomic status” (Laroche, Bergeron, & Barbaro-Forleo, 2001, p. 504). The green consumer also “takes into account the public consequences of his or her private consumption and attempts to use his or her purchasing power to bring about social change” (Webster, 1975, p. 188).

In marketing research, researchers have been trying to profile green consumers since the early 1970’s (Pedersen & Neergaard, 2006) by trying to segment them based on different demographic characteristics and different levels of concern for the environment (Shrum, McCarty, & Lowrey, 1995). The influence of demographics on green behavior has been mixed, however, over the years (Laroche et al., 2001; Peattie, 2001). Many researchers have found that demographics are not as important as psychological variables when attempting to explain consumers’ eco-friendly behavior and activity. (Banerjee & McKeage, 1994; Brooker, 1976; Webster, 1975). In the lodging industry, studies that

segment green consumers and try to understand their demographics, along with other psychographic characteristics, are very limited (Formica & Uysal, 2002; Kasim, 2004; Manaktola & Jauhari, 2007).

Whether or not travelers demand a hotel room with a bundle of environmentally friendly attributes may depend upon a number of factors, in addition to the actual attributes provided in the room. Preference for such a room may depend upon, for example, various traveler behavior, socio demographic characteristics, as well as psychodemographic characteristics, such as attitudes. According to Ajzen and Fishbein (2000), “attitudes are expected to predict and explain behavior” (p. 16). Favorable attitudes towards a product or service should lead to acceptance of that product or service, while unfavorable attitudes towards a product or service should lead to the reject of it (Ajzen & Fishbein, 2000). Essentially, a person’s attitudes may influence the decision pertaining to what type of service or product that person prefers. In the present study, attitudes, socio-demographic characteristics, and behavior will provide more detail about the type of traveler interested in an environmentally friendly hotel room.

#### Problem Statement and Research Questions

The purpose of the present study is to identify both the type of environmentally friendly hotel room a customer most prefers, and the type of customer that prefers such a room. In order to identify the type of environmentally friendly room a customer most prefers, different combinations (scenarios) of environmentally friendly room attributes (e.g., recycling policy, shampoo amenities, controlled lighting, energy efficient lighting, linen policy, towel reuse policy, and green certification) will be presented to travelers

who will then rate their preference for the room incorporating these attributes. Specific research questions, based on understanding what environmentally friendly attributes guests may prefer, are as follows:

1. Which environmentally friendly room attributes, as a bundle, are most preferred by business and leisure travelers?;
2. Is preference for the environmentally friendly attributes in the bundle affected by psycho and socio demographic characteristics of the business and leisure traveler?; and,
3. Is preference for the environmentally friendly attributes in the bundle affected by behavioristic characteristics of the traveler?

#### Assumptions

It is assumed in the present study that respondents will openly and honestly answer the questions posed to them, and that they will have both concern for the environment, and familiarity with environmentally friendly hotels. It is also assumed that, when traveling for business purposes, the traveler's company pays for travel expenses. Similarly, when traveling for leisure purposes, it is assumed that the traveler pays travel expenses directly.

#### Importance of Study

It is essential for hotel managers to understand who their customers are and what they desire when selecting a hotel (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 & Thompson, 1997). If hoteliers understand their customer's preferences, and what services and attributes are most important to them when selecting a hotel, hoteliers can position their product (the hotel or hotel room) to target customers based on those preferences. "For a firm to increase its market share in a highly competitive hospitality business, it must design its service facilities and service characteristics according to customer preferences" (Verma & Thompson, 1997, p. 28). 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 (Verma & Thompson, 1997).

In addition to identifying the most important preferences in relation to environmentally friendly hotel rooms, the results of the present study will also identify what type of customer prefers such rooms. Customers that are interested in green products or services, such as a green hotel room, are typically referred to as green consumers. Green consumers take into consideration whether or not the products or services they want to purchase affect the environment in a negative way (Peattie, 2001). Trying to understand the green consumer is a means to understanding marketing efforts that may be used to attract such consumers, and is an area of focus that has been very popular in the marketing literature (Peattie, 2001). Marketing research in general has placed a particularly heavy emphasis on trying to understand the socio and psycho demographic characteristics of green consumers (Peattie, 2001). Understanding the green consumer in the hospitality arena, despite the current popularity of the green consumer in the marketing arena, is relatively new (Kasim, 2004). The results of the present study will fill the gap created by this paucity of research, and will provide hoteliers with

information about which green attributes they could or should promote in order to attract green consumers. More specifically, the results will identify specific characteristics of those travelers that may select a hotel based on the hotel's commitment to protecting the environment.

### Definitions of Key Terms

**Attitude:** "An enduring disposition to consistently respond in a given manner to various aspects of the world; composed of affective, cognitive, and behavioral components" (Zikmund, 2003, p. 308).

**Bulk Shampoo Amenities:** Soap, shampoo, conditioner, and lotion provided from a bulk dispenser rather than individual packages (Environmentally Friendly Hotels, 2007).

**Business Travel/Trip:** The purpose of a business trip is to (1) make a sales call to a Customer; (2) attend a company meeting; (3) attend a trade show or association meeting; or, (4) meet with other people inside or outside the company (McCleary, Weaver & Hutchison, 1993).

**Business Traveler:** People that travel primarily for business reasons (Ninemeier & Perdue, 2008).

**Energy efficient:** "Requiring a minimum amount of energy to produce a maximum amount of work or functionality" (Green Seal, 2008, p. 7).

**Environmentally friendly (green) products and services (attributes) according to Elkington, Hailes, & Makower (1990) are:**

1. Are not dangerous to the health of people or animals;
2. Do not cause damage to the environment during manufacture, use, or disposal;

3. Do not consume a disproportionate amount of energy and other resources during manufacture, use, or disposal;
4. Do not cause unnecessary waste due either to excessive packaging or to a short life span;
5. Do not involve the unnecessary use of or cruelty to animals; and,
6. Do not use materials derived from threatened species or environments.

**Green Consumer:** Anyone who is influenced by environmental concern when purchasing a service or product (Shrum et al., 1995).

**Green Hotel:** A green hotel is an environmentally conscientious operation that promotes and practices energy efficiency, conservation, and recycling, while at the same time providing hotel guests with a sustainable, clean, and healthy product (Millar & Baloglu, 2008).

**Guestroom Recycle Bins:** Bins that are provided in a guest room so that guests have a place to put recyclable items rather than throwing them away (Environmentally Friendly Hotels, 2007).

**Key cards:** Allow access to a guest room and control the use of power in the room. The units are activated when guests enter their key cards into a wall slot, which then turns on the lights, electrical outlets and climate controls (White, 2007).

**Leisure Traveler:** People that travel primarily for personal reasons (Ninemeier & Perdue, 2008).

**Occupancy sensors:** Energy-saving devices that can trigger lighting and heating/air conditioning units when guest enter the room” (N.C. Division of Pollution Prevention and Environmental Assistance [DPPEA], n.d.).

Sheet Re-use Program: A linen policy that allows guests to decide whether they would like to have their sheets changed everyday during their stay if they are staying more than one night (Environmentally Friendly Hotels, 2007).

Towel Re-Use Program: A linen policy that allows guests to decide whether they would like to have fresh towels everyday during their stay if they are staying more than one night (Environmentally Friendly Hotels, 2007).

### Organization of the Dissertation

This dissertation is organized into five chapters. The first chapter includes an introduction to the problem statement, the problem statement, assumptions of the study, the importance of the study, and definitions of key terms. Chapter 2 provides the review of related literature, and develops the conceptual model and corresponding hypotheses and research questions for the study. The research methods and design, along with data collection methods, measurement scales, and the proposed statistical analysis are presented in Chapter 3. Chapter 4 provides the results of the hypothesis testing and presents answers to the research questions. The study concludes with Chapter 5, which incorporates a discussion of the results, implications, and recommendations for future research.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Introduction

Chapter II first reviews the literature of conjoint studies, and presents the theoretical framework for conducting one. The first section also includes literature about different types of attributes, extrinsic or intrinsic, that may be used as part of a conjoint study. The second section of the chapter, the majority of it, is spent discussing consumer behavior models and the various demographics or consumer characteristics that are influential in such models. The final section of the chapter is a summary of past research that has focused on general hotel attributes and their role in the hospitality industry.

#### Consumer Behavior

The study of consumer behavior focuses on the decision-making process of buying, selecting, evaluating and using products and services.

Consumer behaviour refers to the process of acquiring and organizing information in the direction of a purchase decision and of using and evaluating products and services. This process encompasses the stages of searching for, purchasing, using, evaluating, and disposing of products and services. (Moutinho, 1987, p. 5).



Although the process has primarily focused on products, it is more and more common to study the process as related to the purchase of services such as vacations, or meals in a restaurant.

Purchasing a service is different than purchasing a manufactured product. Services tend to be more intangible than manufactured products, and cannot be felt or experienced before they are purchased (Zeithaml & Bitner, 2000). In addition, services are heterogeneous. Because humans are involved in providing and consuming the services, inconsistencies occur across and within organizations. As Zeithaml and Bitner elaborate, "... the heterogeneity connected with services is largely the result of human interaction (between and among employees and customers) and all of the vagaries that accompany it" (p. 13). Services also differ from manufactured products in that services are perishable. They cannot be saved and sold at a later time. They must be consumed immediately. If not, then revenue is lost (Sirakaya & Woodside, 2005). Finally, the production and consumption of the service occurs at the same time. "Whereas most goods are produced first, then sold and consumed, most services are sold first and then produced and consumed simultaneously" (Zeithaml & Bitner, 2000, p. 13). Moutinho (1987) also argues that consumers receive no tangible rate of return on their service (e.g., vacation) investment. The fact that service purchases possess unique characteristics that differentiate them from the purchase of manufactured products has lead researchers to study consumer behavior and the decision-making process specifically related to tourism services (Sirakaya & Woodside, 2005). Thus consumer behavior models have been created and molded to fit the tourism industry.

### *Consumer Behavior Models*

As cited in Sirakaya & Woodside (2005), most of the models created for the tourism industry rely on the theoretical frameworks developed by general consumer behavior pioneers such as Nicosia (1966), Engel, Kollat, and Blackwell (1968), and Howard and Sheth (1969). These models, referred to collectively as the Grand Models, are typically used to explain the decision making process in relation to consumers' purchase of manufactured goods.

Nicosia (1966) developed one of the first consumer behavior models because he wanted to answer the question "why does the consumer behave the way he does?" (p. 7). The model created to answer that question incorporated the belief that consumer behaviorism was a decision making process that was very involved for consumers and incorporated many variables. "A man's consumer behavior is intertwined with his other behaviors – work, education, religion, politics" (Nicosia, p. 3). Understanding the variables, or other behaviors, would help explain why the consumer behaved in a particular fashion. The process included both internal and external variables that make up a behavior space, or field, "that is defined by the components (dimensions) that the researcher postulates as important" (Nicosia, p. 144). According to the model, there are four fields that make up the decision making process. Field One is the flow of the message, which the consumer then internalizes, from the source to the consumer (external variable). Incorporated into Field One are the firm's attributes as well as the consumer's attributes. Interaction of the variables in Field One will lead to Field Two's search and evaluation of available options for purchase. The motivation to make a purchase based on the results of the search and evaluation transfers into purchase action – Field Three.

Finally, Field Four is the consumers' use of the purchased product. The components the consumer specifically identifies may move around the model depending upon the research question or the purchase situation for the consumer. The overall essence of the model suggests that the decision making process is very circular in that it repeats itself and changes throughout time, and also implies that consumer decisions or acts are not independent of each other.

Engel et al. (1968) were also concerned with how a decision was reached and thus developed the Model of Consumer Motivation and Behavior, also called the EKB Model. Their model is similar to Nicosia (1966) in that it identifies consumer behavior as a decision making process. "A purchase is *one point* in a particular cause of action taken by the consumer. In order to understand that one point (the act of purchasing) it is necessary to examine the events that precede and follow the purchase" (Engel et al., 1968, p. 7). The model was created because very little had been developed at that time that said anything about how elements of a person's psychological field relate to or influence buying decisions. Values and attitudes, defined as "organizations of concepts, beliefs, habits and motives associated with a particular object" (Lunn, 1974, p. 43), were incorporated into the model in order to understand how they may influence different stages in the decision-making process. As with Nicosia, the EKB Model is very complex and involves various stages that consumers move through before and after they make a purchase. There are five linked processes in the decision making sequence: (1) problem recognition; (2) external search; (3) alternative evaluation; (4) purchasing processes; and, (5) post purchase evaluation (Engel et al., 1968). This is a process that consumers do not consciously recognize they are going through, and it may occur quickly or it may occur

over time depending on the purchase situation. In addition, all phases may not always occur.

The last Grand Model is that developed by Howard and Sheth (1969). One of the primary characteristics of the model is that, like the two previous models, it focuses on the individual consumer and what influences the consumer to make a decision. Howard and Sheth make a distinction between “endogenous variables (i.e., those that the theory is designed to explain) and exogenous variables (i.e., additional variables, largely, but not entirely, ‘outside’ the consumer, which have a key influence on the system)” (Lunn, 1978, p. 45). Exogenous variables include importance of purchase, culture, social class, personality traits, social and organizational setting, time pressure, and financial status. Because attention was paid to so many more variables than in previous models, a much more complex model was created.

Another key characteristic of the Howard-Sheth model, which is similar to the other two models, is the importance placed on feedback. Satisfaction with the purchase, Howard and Sheth argue, has an impact on the decision to purchase a product again in the future. What sets the Howard-Sheth model apart from Nicosia and EKB, however, is the fact that Howard and Sheth recognize that the decision-making process will vary depending upon the situation. They make a distinction between extensive problem solving, limited problem solving and routinized problem solving (Lunn, 1974). The decision making process will vary depending on how complex the decision is for the consumer. For example, those consumers in the routinized problem solving stage are essentially purchasing a product out of habit because the consumer has experience with it. There will not be much thought in that decision making process. On the opposite end of

the spectrum is the consumer that has little to no knowledge about a product or service so much information must be gathered before a decision can be made (extensive problem solving).

The three Grand Models of consumer behavior, although all are slightly different, do share common characteristics (Gilbert, 1991). First, they all recognize that consumer behavior is a decision-making process. Second and third, they focus on the behavior of the individual consumer and believe that the consumer is a rational decision-maker. Fourth, “they view buying behaviour as purposive, with the consumer as an active information seeker, both information stored internally and of information available in the external environment” (Gilbert, p. 93). “Buyers narrow down the range of information in time, and choose from the alternatives they developed during the decision-making process” (Sirakaya & Woodside, 2005, p. 817), is the fifth common characteristic. Lastly, all of the models recognize that feedback and experience will affect purchases in the future.

Use of these three Grand Models throughout consumer behavior research has been extensive (Gilbert, 1991). Their application to the tourism industry is somewhat more difficult, however, because all of the models concentrate on the purchase of goods as opposed to services. In addition, tourism purchases typically involve joint decision, especially for vacation selection. The Grand Models only define the individual decision-making process. Finally, despite the inclusion of so many types of variables, none of the models is a definitive predictor, or a clear explanation of, consumer behavior. Because it is difficult to apply the Grand Models directly to the tourism industry, and to the purchase

of tourism services in particular, researchers have adopted similar models that are specifically geared toward the tourism industry.

### *Consumer Behavior Models in Tourism Research*

While primary consumer behavior research began with an emphasis on manufactured goods, the decision making process in regards to services, such as the purchase of a hotel stay or meal in a restaurant, has now become prominent in the literature. The three Grand Models of consumer behavior have been shaped, molded and applied to various research problems relating to the tourism industry.

One of the first to try to make sense of consumer behavior as related to tourism behavior was Wahab, Crampon, and Rothfield (1976). The primary argument behind Wahab et al.'s (1976) study was that tourists are rational decision makers and are able to weigh the costs and benefits of a travel decision (Gilbert, 1991; Sirakaya & Woodside, 2005). The decision making process for a tourist was very complex, precise, and deliberate, resulting in no spontaneous action. An important aspect of Wahab et al.'s (1976) research is that they recognized that tourism products or services have unique characteristics, such as imperishability and intangibility, that differentiate them from "regular manufactured" products (Gibson, 1991; Sirakaya & Woodside, 2005). A weakness of this model is the fact that, acknowledged directly by Wahab et al., tourists may not necessarily be so deliberate in their tourism decisions.

Schmoll (1977) also argued that potential tourists were rational decision makers, and that the travel decision involves many steps. Schmoll's model borrows heavily from the Grand Models of consumer behavior discussed previously, namely the Howard-Sheth and Nicosia models (Gilbert, 1991). The model has four fields, with each field having some

influence over the final travel decision (Schmoll, 1977). The four fields are travel stimuli, personal and social determinants, external variables, and characteristics of the destination that influence the decision. In essence, according to Gilbert, the model is built upon motivations, desires, needs and expectations as personal and social determinants of travel behavior. These are influenced by travel stimuli, the travellers' confidence, destination image, previous experience, and cost and time constraints. The inclusion of image as a part of the decision making process was an important addition to consumer behavior models. What is not taken into account, however, are the effects of attitude and values on the model and final travel decision.

Mayo and Jarvis (1981) applied three styles to how travelers' make their travel decisions – extensive decision-making, limited decision-making, or routine decision-making. Extensive decision-making occurs when a potential traveler has not been to a destination and thus needs to spend more time and research learning about the destination. Routine decisions are those that travelers make on a regular basis and are decisions that they do not even have to think about. Limited decision-making falls in between the two. The search for information in each style is the primary component of the decision making process (Gilbert, 1991).

As with previous models, Mathieson and Wall (1982) borrow heavily from the Grand Models and claim that tourists are rational decision makers that want to maximize utility (Gilbert, 1991; Sirakaya & Woodside, 2005). They introduce five stages into the decision making process: creating a need or desire for travel, information and evaluation search, travel decision, travel preparation and travel, and travel satisfaction/evaluation. An important contribution of Mathieson and Wall's model is that they recognize the

importance of the difference between a service and a product. “Mathieson and Wall recognize that a holiday is a service product with the characteristics of intangibility, perishability and heterogeneity, which in one way or another affect the consumer’s decision-making” (Gilbert, 1991, p. 99). On the contrary, the model excludes such important variables as perception, memory, personality, and information processing (Gilbert, 1991; Sirakaya & Woodside, 2005).

Moutinho (1987) developed a model based on holiday purchase behavior. As he recognizes, his model is also based primarily on the three Grand Models. The three primary fields in Moutinho’s model are pre-decision and decision processes, post purchase and evaluation, and future decision-making. His research determined that customer satisfaction, or the post-purchase evaluation, does have an impact on future travel purchase behavior. Moutinho’s model also emphasized the importance of the role of family members, reference groups, social classes, culture and subculture on the travel decision (Sirakaya & Woodside, 2005). At times, however, “within Moutinho’s model the interrelationship between field and the directional process towards consumer goals is not always clear” (Gilbert, 1991, p. 101). Sirakaya and Woodside also argue that the model does not specifically address the destination choice process.

Van Raaij and Francken’s (1984) focus for tourism behavior was on joint decision-making as opposed to individual decision-making. Specifically, due to the fact that vacations are a major expense category and they are necessary part of people’s lives, the decision to go on vacation will involve input from husband, wife, and children (Van Raaij & Francken). Socio demographic factors, individual factors, and household factors, will influence travel planning as well as the decision to travel, or, as Van Raaij and Francken



refer to it, the “vacation sequence”. Household related variables include life-style, role, power structure, and decision-making style; individual factors include attitude, values and experience; socio demographic factors include, for example, income, age, family size and social class. The addition of household variables to this model is what sets it apart from other tourism models. Overall, however, as Sirakaya and Woodside suggest (2005), it is very similar to the Grand Model created by Engel et al. (1968).

One of the more recent, and most influential, tourism behavior models is that created by Woodside and Lysonski (1989) (Sirakaya & Woodside, 2005). Their General Model of Traveler Leisure Destination Awareness and Choice posits that, as Sirakaya and Woodside (2005) summarized, “destination choice is a result of a categorization process. Awareness of a tourism product will transfer the same from long-term memory to working memory causing that product to be chosen over other possible products” (p. 819). The model was the first of its kind to integrate variables such as affective associations, traveler destination preferences, and situational variables and their place of impact.

Woodside and MacDonald (1994) later extended Woodside and Lysonski’s (1989) model to include the influence of members of the travel party on the decision-making process. They also concluded, in direct contrast to previous models, that tourists are not always rational decision makers. In other words, they do not always wish to maximize utility (Sirakaya & Woodside, 2005). Also, as with previous models, this model fails to consider the influence of the outcome on the next travel-related decision.

Ajzen and Driver (1992) used the Theory of Planned Behavior (TPB) (Ajzen, 1991) to predict leisure intention and behavior. TPB's premise is that people make decisions based on different beliefs. As Ajzen (2006) summarizes:

...human action is guided by three kinds of considerations: beliefs about the likely outcomes of the behavior and the evaluations of these outcomes (behavioral beliefs), beliefs about the normative expectations of others and motivation to comply with these expectations (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors (control beliefs). (p. 1)

Behavioral beliefs result in good or bad attitude towards the behavior itself, while normative beliefs result in the pressure one feels from society to conduct the behavior (subjective norm). Control beliefs are the extent to which one feels a sense of control over the behavior (perceived behavioral control) (Ajzen, 2006). In their study about leisure activity, Ajzen and Driver (1992) surveyed college students about their attitude and intentions towards five leisure activities (spending time at the beach, jogging or running, mountain climbing, boating, and biking), and then surveyed them again one year later to determine if the students had performed any of the activities. Their results indicated that attitudes, subjective norms and perceived behavioral control did predict intention to perform leisure activity, and intention and perceived behavioral control predicted actual leisure behavior.

Um and Crompton (1990) also placed an emphasis on attitudes, but, as opposed to a specific leisure activity, they studied how attitudes may play a role in selection of a travel destination. They argued that selection of a destination was a result of attitude toward

each destination alternative. The decision to travel to a particular location was not based on the characteristics of the location alone, but instead was a three-state process that included:

Composition of awareness set, evoked set, and final destination selection, where the latter is a condensed form of the former. The awareness set of destinations in the potential traveler's mind is formed through passive information from the outside environment, whereas the evoked set emerges with the active information searching from external sources including past experience, media, family, friends and others. (Sirakaya & Woodside, 2005, p. 825)

Um and Crompton's (1990) results suggested that attitudes do play a role in whether a travel destination was chosen as the final destination from the awareness set. A primary argument of Um and Crompton's study, despite the results, is the fact that they do not take into consideration the decision making process itself, or the influence of the outcome of the choice on the next destination choice (Sirakaya & Woodside, 2005).

#### *Summary of Consumer Behavior in Tourism*

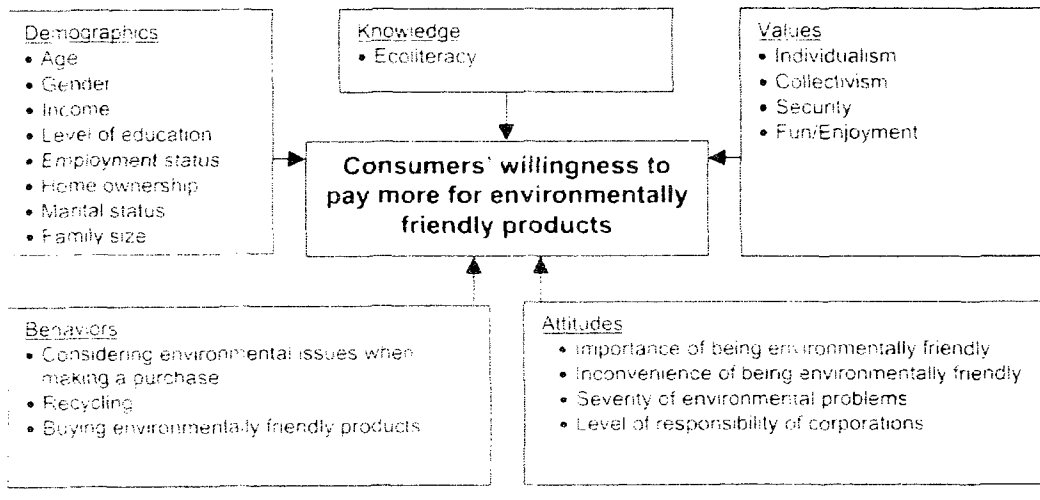
All of the aforementioned models are essentially applied to the decision-making process for purchasing a holiday, or selecting a destination to travel to, and focus on the leisure traveler to answer the question "why and how is a destination selected?" None of the models has been specifically adapted to the decision making process for hotel selection. They do share some common characteristics, however, that can be applied to the present study. "These models are common, in that, the traveler's decision-making process was approached as a functional decision-making activity that is influenced by a number of psychological and non-psychological variables" (Sirakaya & Woodside, 2005,

p. 817). In essence, consumers go through different stages that begin very broadly and end in detail. The process has been compared to a funnel (Sirakaya & Woodside; Yoo & Chon, 2008). “The decision-making process is a funnel-like one, in that travelers narrow down choices among alternatives influenced by sociopsychological factors (e.g., attitudes, motives, values, personal characteristics) and nonpsychological factors (e.g., product design, price, advertising)” (Yoo & Chon, p. 114).

The decision-making process consists of five stages, which are central to all consumer-behavior models: (a) problem recognition; (b) information search; (c) alternative evaluation; (d) choice and purchase; and, (e) post purchase evaluation (Yoo & Chon, 2008). This entire process is influenced by the sociopsychological and non-psychological factors as previously mentioned. It is during the information search and alternative evaluation (stages b and c) that the present study will focus. It is during those stages that consumers look for different alternatives, in this case hotel rooms with green attributes, evaluate them as compared to each other, and choose which one to purchase.

### Conceptual Framework

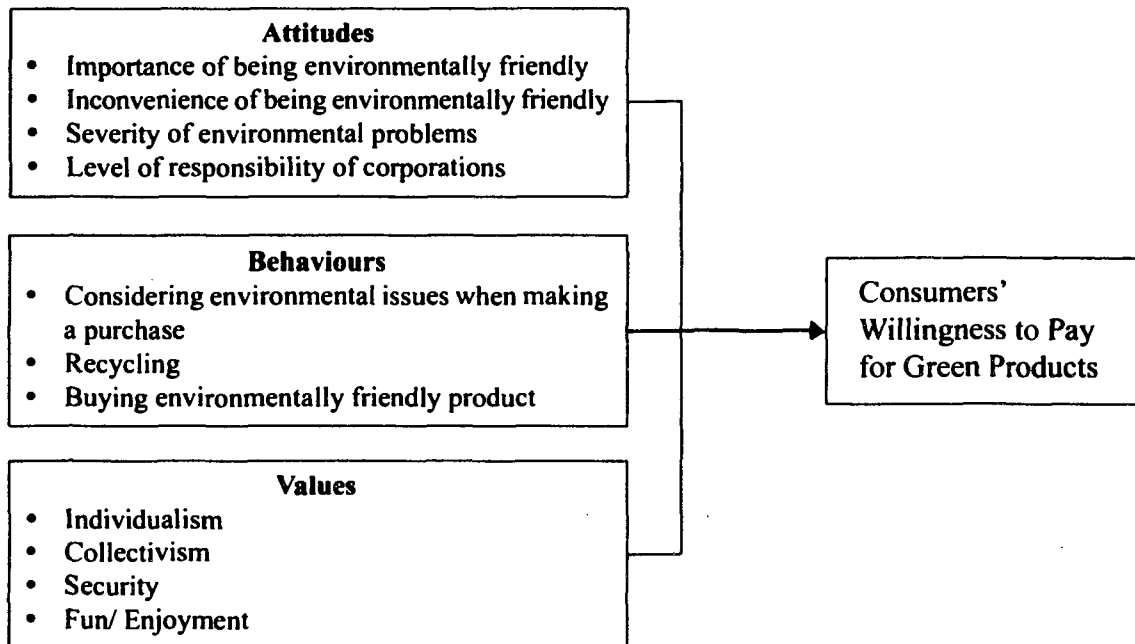
The framework for this dissertation was developed based on consumer behavior models created by Laroche, Bergeron, and Barbaro-Forleo (2001), and Tsen, Phang, Hasan, and Bunch (2006). Both models fit the aforementioned characteristics of the decision making process that are incorporated into most consumer behavior models. Laroche et al.’s (2001) original model, depicted in Figure 1, tested and demonstrated that both psycho and socio demographic characteristics may influence, in their case, a consumer’s willingness to pay more for environmentally friendly products.



*Figure 1.* Conceptual framework developed by Laroche et al. (2001).

*Note.* Reproduced from Laroche et al., 2001, p. 504.

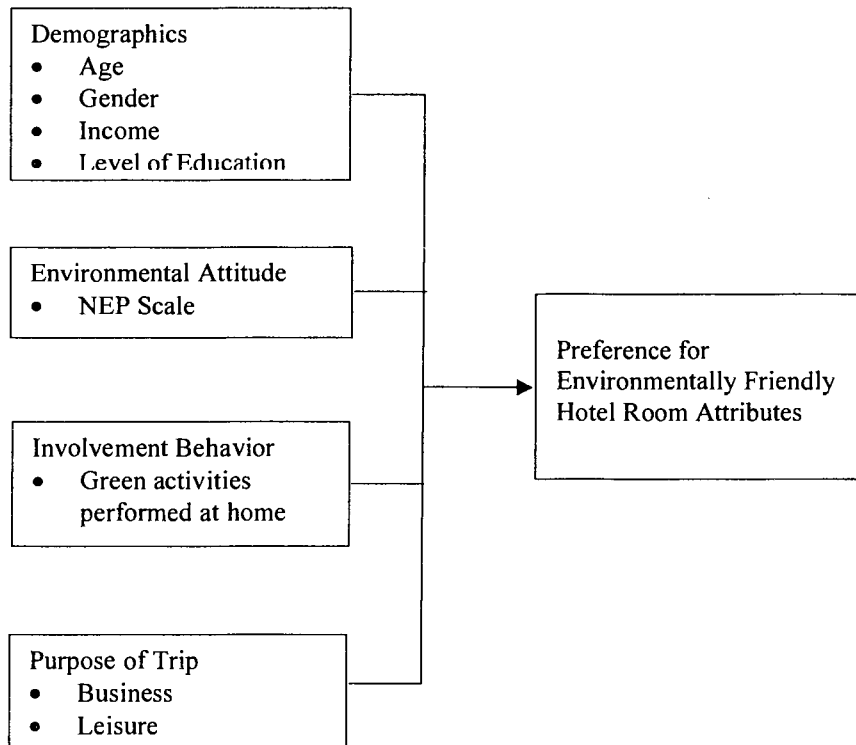
Tsen et al. (2006) extended the work of Laroche et al. (2001) and found that various values and behaviors influenced a consumer's willingness to pay for green products, but did not focus on consumer demographics (see Figure 2). While the present study is not assessing willingness to pay, the premise is the same as the Laroche et al. (2001) and Tsen et al. (2006) models, in that demographic and behavioristic characteristics may influence an outcome, which herein is preference for an environmentally friendly hotel room and the attributes it incorporates. This idea also coincides with the classic consumer behavior models discussed previously.



*Figure 2.* Theoretical model developed by Tsen et al. (2006).

*Note.* Reproduced from Tsen et al., 2006, p. 41.

Based on the aforementioned models, the conceptual model for this dissertation was developed (see Figure 3). The choices travelers make during their decision making process, regardless of the specific consumer behavior model, are influenced by various socio and psycho demographics, as well as non-psychological factors, as the previous models indicate. The literature is replete with research about the influence of



*Figure 3.* Conceptual model for business and leisure travelers’ preferences for green hotel attributes.

*Note.* Adapted from a theoretical model created by Laroche et al., (2001), and Tsen et al. (2006).

demographic variables on behavior, in particular environmentally friendly behavior (Firat, 2009). Significant and positive relationships have been found between age and environmentally friendly behavior (D’Souza, Taghian, Lamb, & Peretiatko, 2006; Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Roberts, 1996; Samdahl & Robertson, 1989; Straughan & Roberts, 1999), although others have found the opposite

relationship (Tognacci, Weigel, Widen, & Vernon, 1972; Van Liere and Dunlap 1981; Zimmer, Stafford, & Safford, 1994), while still others have found no relationship (Kinnear, Taylor, & Ahmed, 1974; Laroche, Bergeron & Barbaro- Forleo, 2001; Rowlands, Scott, & Parker, 2003; Shamdasani & Chon-Lin, 1993). The results for the influence of age on behavior have been inconclusive; therefore, this dissertation will test the following hypothesis and its two sub-hypotheses:

H1: Average preference scores for green attributes will differ due to age;

H1<sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to age; and,

H1<sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to age.

It is typically believed that women are more environmentally conscious than are men. Research results, however, have not been able to definitively prove this belief (Firat, 2009). Support for the belief that gender does influence environmentally friendly has been identified by a number of researchers (Hounshell & Liggett, 1973; Laroche et al., 2001; Roberts, 1996; Smith, 2001; Stern, Dietz, & Kalof, 1993; Van Liere & Dunlap, 1981), but several have also found no significant differences between the two (Arbuthnot, 1977; Brooker, 1976; Samdahl & Robertson, 1989, Tognacci et al, 1972).

H2: Average preference scores of green attributes will differ due to gender;

H2<sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to gender; and,

H2<sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to gender.



The third demographic hypothesis is related to income. It is commonly believed that people performing environmentally friendly behavior earn a higher income than those who do not perform environmentally friendly behaviors (Firat, 2009), or, as income increases, so does the behavior. As with the other demographic variables mentioned thus far, though, researchers have been unable to support this belief. In fact, several researchers have found effect of income on behavior (Antil, 1978; Kassarian, 1971; Kinnear et al., 1974; Shamdasani & Chon-Lin, 1993; Van Liere & Dunlap, 1981; Zimmer et al., 1974). Only a few have found any effect (Roberts, 1996; Samdahl & Robertson, 1989).

H3: Average preference scores of green attributes will differ due to income;

H3<sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to income; and,

H3<sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to income.

Education has proven the most consistent demographic variable when assessing its influence on behavior. Most of the results have indicated that as education increases so too does the behavior (Aaker & Bogazzi, 1982; Arbuthnot, 1977; Diamantopoulos et al., 2003; Leonard-Barton, 1981; Roberts, 1996; Tognacci et al., 1972, Van Liere & Dunlap, 1981; Zimmer et al., 1994).

H4: Average preference scores of green attributes will differ due to education;

H4<sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to education; and,

H4<sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to education.

### Involvement

A consumer's involvement with a product or service may affect the evaluation of that product or service (Lee & Lou, 1995). Involvement is most often defined as a person's perceived personal relevance "of an object based on her or her needs, values and interests" (Lee & Lou, 1995, p. 22). In this case, a hotel guest's involvement with the product (environmentally friendly hotel room) will depend upon how important the guest perceives the room to be to him or her personally. Essentially, they assess whether the product will benefit them in some way, or help them to achieve their personal goals in life (Celsi & Olson, 1988). Celsi & Olson go on to further state that:

To the extent that product characteristics are associated with personal goals and values, the consumer will experience strong feelings of personal relevance of involvement with the product. (p. 211)

As applied to this dissertation, if the environmentally friendly hotel room and its incorporated green attributes are important to the hotel guest because the guest feels the room is similar to his or her personal goals or beliefs, then involvement with the room will be high.

There are different types of involvement, discussion of which is beyond the scope of this dissertation. One often-discussed type, however, that applies to this study is enduring involvement, which occurs when a consumer has a high level of expertise about the product category (Lee & Lou, 1995). If a potential hotel guest performs activities at

home that are directly related to protecting the environment (i.e., recycling, use of energy efficient appliances), their level of enduring involvement with the environmentally friendly hotel room would be high because they have knowledge of the hotel room's attributes (they are familiar with them at their home). "When personally relevant knowledge is activated in memory, a motivational state is aroused and is often manifested in overt behavior (e.g. participation, search behavior, memberships, affiliations, etc.)" (Kyle, Absher, Norman, Hammitt, Jodice, 2007, p. 400). Thus, high enduring involvement, measured by the guest's involvement with protecting the environment at home, in theory, would lead to greater importance placed on the green attributes incorporated into the hotel room. The following hypothesis, and two sub-hypotheses were therefore created:

H5: The more environmentally friendly activities travelers perform at home, the greater their preference for green attributes;

H5<sub>a</sub> = The more environmentally friendly activities business travelers perform at home, the greater their preference for green attributes; and,

H5<sub>b</sub> = The more environmentally friendly activities leisure travelers perform at home, the greater their preference for green attributes.

### Attitudes

Attitudes are the most heavily researched topic in the social sciences (Churchill & Iacobucci, 2005; Um & Crompton, 1990; Yoo & Chon, 2008). According to Zikmund (2003), attitudes are often defined as: "an enduring disposition to consistently respond in a given manner to various aspects of the world; composed of affective, cognitive, and

behavioral components” (p. 308). An affective component represents a person’s feelings about something, while the cognitive component represents the person’s knowledge of the object. The behavioral component is the intended action or expectation about the action, as a result of the feelings and beliefs. As Churchill and Iacobucci (2005) summarize, attitudes represent “a person’s ideas, convictions, or liking with regard to a specific object or idea” (p. 267). In essence, attitudes represent a person’s general evaluation, or like or dislike, of something. Attitudes are prominent in consumer behavior research because they are thought to lead to, or predict, actual consumer behavior. If a person likes, for example, an environmentally friendly hotel room, they would be more inclined to purchase such a room than if they did not like it.

Attitudes alone, however, are not the best predictor of consumer choice. It is when attitudes are coupled with other attributes such other demographic characteristics, or such as the characteristics of a tourism destination or attributes of a hotel room, that the ability to accurately reflect consumer choice is enhanced (Um & Crompton, 1990; Yoo & Chon, 2008). Called multiattribute models (e.g., Fishbein and Ajzen, 1975), they have attempted to relate attitudes to behavior, in particular whether attitude predicts behavior. The results of the studies that have attempted to relate attitude and behavior, however, have been inconsistent (Dunlap & Van Liere, 1984; Formica & Uysal, 2002). Instead, they have proven more effective as predictors of preference (Um & Crompton, 1990).

#### *Environmental Attitudes in Travel and Tourism*

Understanding the general public’s attitude towards the environment became prominent in the 1970’s when much attention was paid to air and water pollution (Dunlap, Van Liere, Mertig & Jones, 2000). It has now also become prominent in the

travel and tourism literature (Formica & Uysal, 2002). One of the first studies assessing environmental attitude in a tourism context was that of Uysal, Jurowski, Noe, and McDonald (1994), while one of the first related to leisure activity was a study conducted by Noe and Snow (1990). Uysal et al.'s (1994) results indicated that concern for the environment was influenced by trip behavior but not by demographic characteristics of tourists. Dunlap and Van Liere (1984) found similar results. Surveying visitors to national parks, Noe and Snow found park visitors in favor of conservation and preservation had strong environmental attitudes. Formica and Uysal (2002) used environmental attitudes as a segmentation tool of travelers to Virginia and determined attitudes a better segmentation tool than demographic characteristics.

Other studies have assessed ecotourist's attitudes towards the environment (Fennell & Nowaczek, 2003; Wurzinger & Johannson, 2006); hoteliers attitudes toward the environment (Bohdanowicz, 2005; 2006); hotel guests' attitudes towards a green lodging property's overall environmental policy (Manaktola & Jauhari, 2007); attitudes influence on leisure time (Bjerke, Thrane, & Kleiven, 2006; Wolch, 2004); resident attitude toward tourism development (Jones, Jurowski, & Uysal, 2000; Kaltenborn, Andersen, Neillemann, Bjerke, & Thrane, 2008), and recreational behavior's affect on environmental attitude (Jackson, 1987; Tarrant & Green, 1999). Because attitudes are a common measure of behavior or preference, the following hypothesis and two sub-hypotheses were tested in this dissertation:

H6: The higher the average environmental attitude score for a traveler, the greater the preference for green attributes;

H6<sub>a</sub> = The higher the average environmental attitude score for a business traveler, the greater the preference for green attributes; and,

H6<sub>b</sub> = The higher the average environmental attitude score for a leisure traveler, the greater the preference for green attributes.

### Previous Studies About Hotel Attributes

The study of hotel attributes is prominent in the hospitality and tourism literature (Dolnicar, 2002). Dolnicar and Otter (2003) conducted a meta-analysis of all attribute-related studies conducted between 1984 and 2000. They identified 173 attributes relating to image, price/value, hotel, services, room, marketing, food and beverage, security, location and others that were used in attribute research. The primary area of study has focused on the importance travelers place on certain attributes when selecting a hotel to stay in (Ananth, DeMicco, Moreo, & Howey, 1992; Callan & Bowman, 2000; Clow, Garretson, & Kurtz, 1994; Cobanoglu, Corbaci, Moreo, & Ekinci, 2003; Dolnicar, 2002; Griffin, Shea & Weaver, 1996; Lewis, 1984a; Lockyer, 2002; Lockyer, 2005; McCleary, Weaver & Hutchinson, 1993; Saleh & Ryan, 1992; Tsaor & Tzeng, 1995; Weaver & Oh, 1993).

Other studies include those that simply identified attributes, but not how they influenced behavior, (Cadotte & Turgeon, 1988; Dube & Renaghan, 1999; Dube & Renaghan, 2000a; Lewis, 1984a; Lewis, 1984b; Shanahan & Hyman, 2007); how attributes affect service quality (Callan & Bowman, 2000; Hartline & Jones, 1996; Saleh & Ryan, 1992); how attributes affect customer satisfaction (Barsky & Labagh, 1992; Gunderson, Heide, & Olsson, 1996); loyalty building (Bowen & Shoemaker, 1998);

evaluation (Tsaour & Tzeng, 1995; Wind et al., 1989); gender differences in hotel selection ( McCleary, Weaver & Lan, 1994); and the value of attributes for intermediaries that make travel arrangements (Dube & Renaghan, 2000b).

Several studies have compared business travelers to leisure travelers, while others have focused solely on business travelers, and their preference for, or importance placed on, certain hotel attributes (Dolnicar & 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. Business travelers perception of hotel attributes was much more critical than that of leisure travelers. 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. The study focused on frequent travelers of three hotel categories – economy, midprice and luxury. Regardless of category, however, travelers rated clean/comfortable room, convenient location, prompt and courteous service, safe and secure environment, and friendly and courteous employees, as the most important attributes.

Barsky and Labagh (1992) wanted to understand strategic planning and decision making in hotels, and, in turn, the affect on customer satisfaction. To do so, they developed a formula in which hotel attributes, and met expectations of them, are included as a measure of customer satisfaction. The findings showed that employee attitude, location, rooms, and prices were the primary attributes influencing guest satisfaction. Gunderson et al. (1996) also studied attributes in relation to guest satisfaction.

Housekeeping (i.e., cleanliness) and the reception department (i.e., friendliness) best explained overall customer satisfaction.

Bowen and Shoemaker (1998) took a different approach to studying attributes. They focused specifically on the selection of luxury hotels and the attributes affecting loyalty to a particular luxury hotel. Upgrades, flexible check in/check out times, and the use of information from prior stays to customize services were the three top attributes that engendered guest loyalty. Dube and Renaghan (1999) identified attributes that most influenced customer's perception of value when deciding which hotel to stay in, and value during the hotel stay. The top five attributes for hotel selection were location, brand name and reputation, physical property, value for money, and guest-room design. The top five for value during the hotel stay were guest-room design, physical property, service (interpersonal), service (function), and food and beverage related services.

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 Virginia Polytechnic Institute and State University and Lodging Hospitality (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). Despite the fact that travelers in the survey said they were likely to stay in hotels that provided such



attributes, and despite the fact that a large portion of the travelers considered themselves environmentally conscious consumers, they did not necessarily consider themselves environmentally conscious travelers. In other words, their beliefs were not necessarily followed up by their actions when traveling.

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).

The environmentally friendly attributes in the present study stemmed from the aforementioned studies. There are seven attributes in total, which two level for each of them. The first attribute, recycling policy (RP), is introduced as: (a) recycling bin in the guest room; and, (b) 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. Approximately 80% of that waste can be recycled (North Carolina Division of Pollution Prevention and Environmental Assistance [DPPEA], n.d.). Recyclable items found in guest rooms often include aluminum cans, glass and plastic bottles, and newspaper. Currently, some hotels do have successful recycling policies in place. For example, The Walt Disney Company has recycled more than 850,000 tons of materials since 1991 (The Walt Disney Company, 2008). Such policies are not as prominent, however, in the front of the house. Placing recycling bins in the either the guest room or hotel lobby will require that the guest be responsible for recycling. It is

unclear, though, the extent to which hotel guests are willing to take that responsibility; this is the reason for including recycling in this study.

The second environmentally friendly attribute, shampoo amenities (SA) is introduced as: (a) individual bottle; and, (b) refillable dispenser. 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. Hotels can also save money by using refillable dispensers. They “cost hotels less by reducing related product waste up to 70 percent and saving cleaning staffs considerable time by not having to replace amenities daily” (Burger, 2003, p.2). One hotelier elaborates on the use of a specific refillable amenity program:

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. Green Suites' Bathroom Amenities Program saves us \$500 or more per month. 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)

In the past, however, there has been some resistance by both hotel guests and hoteliers to using refillable dispensers. As a result, according to the American Hotel and Lodging Association, only 22% of lodging properties use them (Hasek, 2008). Hotel guests have concerns about what's actually in the dispensers, how clean they are, and dispensers tend to remind them of showering at the gym. In addition, hoteliers complain that dispensers are unattractive looking and do not fit with room décor.

The lack of amenities at the individual level (i.e., individual bottles) also has an impact on star and diamond hotel quality ratings. Hotels offering a plethora of sink-side amenities, along with various other hotel attributes, usually receive higher ratings. For example, the Diamond Rating Guideline published by the American Automobile Association (2008) requires four-diamond hotel properties to have a seven-piece personal care package in the guest bathroom that includes two large bars of soap, three bottled items and two additional items, all presented in an upscale fashion. Removal of the two additional items and one of the bottled items lowers the ratings to three diamonds. Despite all of these issues, however, some hotels have successfully implemented the use of dispensers, and, in the process, are saving money and protecting the environment, as mentioned above. Thus, they are included in the present study to better understand the extent to which hotel guests will accept such an environmentally friendly attribute.

Controlled lighting (CL) is the third attribute. A significant cost to hoteliers is lighting left on in hotel guest rooms when the guest is not in the room. Hotel bathroom lights tend to use the most electricity in a hotel room, and are, on average, left on between five to eight hours per occupied day (California Energy Commission, 2005). There are several solutions to controlling bathroom 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). Occupancy sensors, particularly in the bathroom, have the potential to reduce energy consumption by 15% to 20% (Sacramento Business Journal, 2003). Occupancy sensors work by turning lights off after a specified period of time if no motion is detected in the room.

Room key cards work when the hotel guest places it, upon entering the room, into a slot located next to the door. Once the card is in place, power to the room is activated. The use of key cards is fairly prominent outside of the United States (U. S.) but they are becoming better known in the U. S. as more and more hotels look for alternative ways to conserve energy and save money. One hotelier in Pittsburgh, Pennsylvania cited that the \$120,000 cost to install a key card system was recouped after only 15 months (White, 2007). Both options, key cards and occupancy sensors, have the potential to save hoteliers money and reduce their energy output. It is unclear, however, how hotel guests will react to such devices, and this is the reason for their inclusion in the present study.

According to Fairmont Hotels and Resorts (2007), 15% to 25% of total electricity consumption in an average hotel comes from lighting. Because lighting is such a large use of energy, energy efficient light bulbs (EEB) is the fourth attribute. According to the United States Environmental Protection Agency (2008), energy efficiency “means delivering the same (or more) services for less energy” (§ 1). Changing light bulbs from typical incandescent light bulbs to compact fluorescent bulbs (CFLs) can deliver the same amount of light while using less energy. They can also save a hotel a large amount of money (Fairmont Hotels and Resorts, 2007; Stipanuk, 2006). In a campaign to reduce energy consumption and cost, Marriott introduced a “Re-lamp” program. They replaced 450,000 light bulbs with energy efficient compact fluorescent bulbs for a savings of 65% on overall lighting costs and energy usage in guest rooms (American Hotel & Lodging Association [AH&LA], 2008). CFLs produce less heat, which translates into less air conditioning to cool a room, and they also last longer than incandescent bulbs. The lifespan of a CFL ranges from 7,000 to 20,000 hours, while the lifespan of an

incandescent bulb is 2,000 or less (Stipanuk, 2006). When switching to CFLs, a hotelier can save money on labor because bulbs do not need to be replaced as often, and energy is also conserved.

One disadvantage of CFLs is their color rendition. Color rendition refers to the ability of a light source to provide a color that is similar to the color portrayed by sunlight (Stipanuk, 2006). The color rendition of CFLs is very poor, while it is perfect for incandescent bulbs. The poor color rendition of a CFL may be an issue in the guest room of a hotel. The lighting in the guest bathroom needs to be adequate enough so that guests can easily apply make-up, shave, or style their hair (Stipanuk). By the same token, the lighting also needs to be adequate enough throughout the rest of the room that the guest can easily read, or see around the room. If lighting is inadequate, guests may complain. While energy efficient lighting is definitely a cost saving for a hotelier, and it minimizes energy usage, which is good for the environment, it may not be suitable, or acceptable for guests. The two-levels of energy efficient lighting used in the present study are simply energy efficient light bulbs in the guest room, and no energy efficient light bulbs in the guestroom.

The fifth and sixth attributes are a towel policy (TP), introduced at two levels – a towel-reuse program, or fresh towels – and a linen policy (LP), 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). Such linen re-use programs help to save money and conserve water at the same

time. A 150-room hotel can save about \$30,000 in operating expenses, 98,000 gallons of water, and 655 gallons of detergent in one year simply by offering a towel and linen reuse program (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. One such association is the Green Hotel Association (GHA). The GHA brings together those hotel owners that are concerned about the environment. While it does not provide any sort of certification, the association does provide information about environmental products that hoteliers may purchase, as well as signage that hoteliers may purchase and place in their hotels (Green Hotel Association, n.d.).

In contrast to an association, a certification program provides hoteliers the opportunity to have their hotel rated based on predetermined environmental practices and policies. Ratings may vary depending on the organization selected to certify the hotel. 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.

Green Seal, originally created to test and certify manufactured green products, has been adapted to the lodging industry. They set specific environmental standards for lodging properties to adhere to (Green Seal, 2008). Green Seal has three levels of certification for which a hotel management may apply: bronze, silver and gold. The

hotel will be certified at the appropriate level based on its level of commitment to protecting the environment. In order to be certified, hotel managers must fill out an extensive application, which Green Seal administrators use to approve or deny certification. If standards are met, the lodging property will receive Green Seal certification, and a Green Seal logo, that they may display on property or use as advertising material (Green Seal, 2008). Green Seal has also helped organizations, such as the states of California and Florida develop a basis for green lodging programs. Green Seal is primarily based in the U. S.

Green Globe, a worldwide certification program, has also created a set of standards, or benchmarks, at three different levels (bronze, silver, and gold) that are used to certify a hotel as environmentally friendly. Once certification is achieved via self-assessment tools and physical audits, hotels, as is the case the other certification programs, may use Green Globe logos as part of their advertising material. An ecolabel program based in Canada, Ecotel's certification process begins with physical hotel inspections that assess five areas of the hotel: environmental commitment; solid waste management; energy efficiency; water conservation; and, employee education and community involvement. Hotels receive from one to five globes based on their level of environmentalism.

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).

Such green certification programs, most commonly referred to as ecolabel programs on a worldwide level, have been gaining in popularity (Fairweather & 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 & 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 & Simmons; Spittler & Haak, 2001; Weaver, 2001a). 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 & Maslin; Hamele, 2002; Wood & Halpenny, 2001).

#### *Intrinsic versus Extrinsic Attributes*

When selecting a service or product, customers rely on the attributes or “cues” to help them make a decision (Crane & Clark, 1988; Lee & 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 & Clarke, 1988, p. 53). They are used to help consumers evaluate goods and services. 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, & 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 & 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 & 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 & Lou, 1995). Extrinsic attributes are the intangible cues of the product, such as price, brand, or image (Olson & Jacoby, 1973; Veale & Quester, 2009). A change in an extrinsic attribute will not directly affect the physical product or service (Veale & 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, Fandos, & Flavian, 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; Lee & Lou, 1995; Espejel et al., 2009; Veale & 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 & Lou, 1995).

Green certification, an extrinsic cue, is the only attribute that cannot be felt or experienced, and is one that does not directly alter the physical hotel room. Based on the aforementioned literature review, the following hypothesis, and two sub-hypotheses are proposed:

**H7: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room.**

**H7<sub>a</sub>: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room for business travelers; and,**

**H7<sub>b</sub>: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room for leisure travelers.**

### Conjoint Analysis

Conjoint analysis is an analytical technique first referenced in 1964 by the psychologist Luce, and Tukey, a statistician (Green & 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 & Tukey, 1964). Not long after, Green and Rao (1971) produced an article describing

how conjoint analysis may be applied to marketing research problems, and “quantifying judgmental data” (p. 355). Green and Rao argued that conjoint analysis could potentially help managers understand buyer preferences and how buyers make decisions for products or services that consist of multiple attributes, or characteristics. “For example, one’s preference for various houses may depend on the joint influence of such variables as nearness to work, tax rates, quality of school system, anticipated resale value, and so on” (Green & Rao, 1971, p. 355). Applied to the present study, it might be said that one’s preference for various green hotel rooms may depend on the joint influence of different green attributes.

#### *Previous Conjoint Studies in Tourism*

Conjoint analysis is one of the many methods that have been used to understand tourist preferences in the tourism industry. Thyne, Lawson, & Todd (2006) measured how cultural differences between tourists and hosts impact host communities. Specifically, Thyne et al. (2006) determined that hosts developed different preferences for tourist-type based on tourist attributes. The most important tourist attribute identified was the nationality of the tourist. A similar line of research conducted by Lindberg, Dellaert and Rassing (1999) identified trade-offs that host communities were willing to make with respect to the impact of tourism on the community, and determined that residents were willing to accept tourism and the negative effects it might bring (i.e., traffic), as long as the tourism also brought positive effects (i.e., new jobs) to the community.

Apostolakis and Jaffry (2005) examined consumers (tourists) preferences for heritage attractions on the Greek island of Crete. Tourists rated their preference for new products

and services introduced at the attractions, and their probability of visiting each attraction based on a combination of the new products and services. Tourists preferred to visit the heritage attractions as long as the new products and services did not interfere with the authenticity of the attraction.

Louviere and Woodworth (1983) applied conjoint analysis to a number of different scenarios in order to demonstrate the many applications of the method. For example, they studied destination choice as a function of destination and cost of an airline ticket. The results indicated that tourists, based on a sample of Australian residents, were sensitive to ticket prices but the strength of sensitivity varied by international destination. Tourists were more sensitive to ticket prices to New Zealand than they were, for example, to Japan. In further tourism research, Feather, Hellerstein, and Tomasi (1995) analyzed destination choice based on destination quality and cost. The destinations were various lakes in Michigan that were popular for recreational activities. Tourists based their destination choice on prices and environmental quality (i.e., water quality) of the destinations.

Limburg (1998) employed conjoint analysis to understand what combination of attributes was important to consumers when selecting a city to visit. Limburg proposed that cities have a "supply of assets", all of which may not be equally important to every traveler. The purpose of the study was to understand which bundle of attributes, or assets, was most preferred. While all attributes were found important, some were more important than others. A city that promoted the most attractive attributes would, according to van Limburg, succeed in attracting visitors. In order to determine what type of weekend hotel packages would draw travelers to a particular city, Lewis, Ding, and

Geschke (1991) used a full profile method of conjoint analysis to identify attributes important in choosing a weekend package. Various price levels were the most significant attributes for the hotel package, while provision of different amenities played a very limited role in the decision making process.

Conjoint methodologies have also been used in the meetings and events industry to understand meeting planners preferences in hotel selection (Hu & Hiemstra, 1996) as well as the trade offs they make when they decide a meeting location (Renaghan & Kay, 1987). Hu & Hiemstra (1996) used hybrid conjoint analysis to measure the importance of individual hotel attributes to hotel-selection decisions made by meeting planners. Their results found price range to be the most important attribute among six attributes tested (price range, functional properties of meeting rooms, hotel conference planning procedure, hotel guest room comfort, food and beverage function, and hotel location), followed by hotel location. The primary purpose of Renaghan and Kay's (1987) study was to understand everything that meeting planners wanted in a meeting facility, which of these attributes were the most important, and which ones they would give up to get something else. The bundle of attributes that meeting planners identified as the most relevant for a conference facility were meeting rooms with extra space to move around, nearby breakout rooms, audiovisual availability, low price, and the ability to control lighting and temperature of the room from various locations in the room.

In addition to studying tourism, and the meetings and events industry, conjoint analysis has also been applied to the foodservice industry. Trying to understand restaurants and how to entice patrons to return to a restaurant, Dube, Renaghan and Miller (1994) analyzed the specific attributes of customer satisfaction that patrons

perceived as most important when visiting a restaurant. They determined that certain types of customers (e.g., pleasure vs. business) were willing to make trade-offs in customer satisfaction based on different service-level attributes (i.e., tasty food or atmosphere) provided by the restaurant. In other restaurant research, Koo, Tao and Yeung (1999) surveyed restaurant patrons in Hong Kong in order to determine the utility value of specific restaurant attributes and how the values placed on the utilities varied under different circumstances. For example, their study found that preference for different bundles of restaurant attributes may vary by the purpose of the restaurant visit (e.g., family meal, business entertainment, or tourist). Verma and Thompson (1996) and Verma, Thompson, and Louviere's (1999) studies evaluated how customers selected pizza delivery chains by focusing on the different attributes of the pizza delivery chain. They found that the probability of a customer choosing a pizza delivery company decreased as the price of the pizza, promised delivery time or late delivery time increased. If the pizza delivery company offered coupons or more variety, however, the probability of a customer selecting that company increased.

While choice modeling methodologies appear in the hospitality literature in general, they are not as prominent in hotel literature, in particular hotel selection. Wei, Ruys, and Muller (1999) surveyed both hotel marketing managers and older people to determine what levels and combination of the attributes price, location, facilities, hotel restaurant, room furnishings, front-desk efficiency and staff attitude were most important to them. Conjoint analysis determined that hotel facilities, followed by room furnishings, were most important to both groups. The results were used to help identify any gaps that may

have existed between marketing managers, and more mature traveler's, expectations about how hotel attributes affected customer satisfaction.

In their study relating to hotel amenity pricing, Goldberg, Green, and Wind (1984) used a categorical hybrid conjoint model to see if predictions could be made about an individual's preference for a bundle of hotel amenities. In addition, they analyzed whether the individual amenities carried different levels of preference, and how overall price of the bundles affected preference. The conjoint model they used indicated that the overall price of the bundle of amenities did impact preference for the bundles. In addition, preference for an individual amenity was not necessarily a good predictor of preference for a bundle of amenities that included the individual amenity. Moskowitz and Krieger (2003) also studied bundles of amenities but took a different approach by deconstructing hotel advertisements in order to determine which Internet advertised amenities were most preferred by business travelers staying in intermediate priced hotels. The intention was to uncover new market segments, based on preferred attributes, for hotels to target. Four segments were identified – “interested but not responsive”; “room as office”; “pamper me”; and, “room as vacation”. Overall business travelers most desired hotel attributes were those that allowed them to conduct business in the hotel room.

In one of the most prominent studies using conjoint modeling, Wind, Green, Shifflet, and Scarbrough (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.

### *Theoretical Framework of Conjoint Analysis*

The theoretical framework for traditional conjoint analysis lies in Lancaster's (1966) theory of consumer demand. Lancaster (1971) argued that traditional demand theory only indentified 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. 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)

Papatheodorou (2001) elaborates by offering "utility is related to the consumption of the products' intrinsic properties, namely characteristics" (p. 166). For example, an individual wishing to purchase a car will find a car that possesses all of the characteristics that make an ideal package for that individual. The package may include objective characteristics such as color, engine size, or how much gas the vehicle gets per mile. In



the present study, the package consists of the green attributes (characteristics) in the hotel room, while the hotel room is the package comprised of the green attributes. Travelers then gain utility by being in a particular hotel room for some period of time, thereby consuming the hotel's and the hotel room's characteristics (Tussyadiah, Kono, & Morisugi, 2006). The package, whether it is a car or a hotel room, will suit one person but not necessarily the next person. It becomes important, therefore, to understand which combination of characteristics are preferred by most individuals so that marketing managers can tailor their products to those individuals.

Based on the aforementioned review of the conjoint literature, and Lancaster's Theory of Consumer Demand, two research questions are herein proposed:

- 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?

### Summary

This chapter developed the conceptual framework, research questions, and hypotheses. The proposed methodology for hypotheses testing and conjoint analysis will be discussed in the next chapter.

## CHAPTER III

### METHODS

#### Introduction

This chapter presents the methodology used to answer the research questions and test the research hypotheses in this dissertation. It begins with a summary of the research questions and hypotheses, followed by a discussion about the definition and different types of conjoint studies. The section about sample selection and measurement tools used in the study follows next. The middle part of the chapter focuses on the attributes used, and how the scenarios that were incorporated into the study were created. Development of the survey instrument and the data collection methods are discussed next. The chapter ends with a discussion about proposed reliability and validity testing.

#### Summary of Research Questions and Hypotheses

Based on the conceptual framework, research objectives, and literature review, the following research questions and hypotheses are proposed for this study:

Research Question 1 (R1): Which bundle of environmentally friendly hotel attributes will be most preferred by business travelers?

Research Question 2 (R2): Which bundle of environmentally friendly hotel attributes will be most preferred by leisure travelers?

Hypothesis 1<sub>a</sub> and 1<sub>b</sub>: Mean differences will exist between a traveler's preference for each green attribute and business and leisure traveler's age, respectively.

Hypothesis 2<sub>a</sub> and 2<sub>b</sub>: Mean differences will exist between a traveler's preference for each green attribute and business and leisure traveler's gender, respectively.

Hypothesis 3<sub>a</sub> and 3<sub>b</sub>: Mean differences will exist between a traveler's preference for each green attribute and business and leisure traveler's income, respectively.

Hypothesis 4<sub>a</sub> and 4<sub>b</sub>: Mean differences will exist between a traveler's preference for each green attribute and business and leisure traveler's education, respectively.

Hypothesis 5<sub>a</sub> and 5<sub>b</sub>: The more environmentally friendly activities business and leisure travelers perform at home, respectively, the greater their preference for green attributes.

Hypothesis 6<sub>a</sub> and 6<sub>b</sub>: The higher the average environmental attitude score for a business or leisure traveler, respectively, the greater the preference for green attributes.

Hypotheses 7<sub>a</sub> and 7<sub>b</sub>: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room for business and leisure travelers, respectively.

### Conjoint Analysis

Conjoint analysis enables researchers to measure the value for each of the attributes used in the hotel room (part-worths), along with the total value of the product (the hotel room) for consumers. As Orme (2006) describes:

The key characteristic of conjoint analysis is that respondents evaluate product profiles composed of multiple conjoined elements (attributes or features). Based on how respondents evaluate the combined elements (the product concepts), we deduce the preference scores that they might have assigned to individual components of the product that would have resulted in those overall evaluations ... The fundamental

premise is that people cannot reliably express how they weight separate features of the product, but we can tease these out using the more realistic approach of asking for evaluations of product concepts through conjoint analysis. (p. 25)

Further, Hair, Black, Babin, Anderson, & Tatham (2006) explain:

Conjoint analysis is a multivariate technique developed specifically to understand how respondents develop preferences for any type of object (products, services, or ideas). It is based on the simple premise that consumers evaluate the value of an object (real or hypothetical) by combining the separate amounts of value provided by each attribute. Moreover, consumers can best provide their estimates of preference by judging objects formed by combinations of attributes. (p. 464)

Essentially, conjoint analysis is a research tool that academics and industry professionals may both use to understand the bundle of attributes that are important to consumers when they purchase a product or service. It can measure the degree of importance of each product attribute and its influence on the consumer's choice of the overall product (Lewis, Ding, & Geschke, 1991).

In the present study, the hotel room is the "good", bundle, or product, with multiple attributes. The different attributes making up a hotel room will influence a buyer's decision whether to purchase the room or not. Furthermore, conjoint analysis can provide

the trade-offs among attributes that consumers are willing to make when selecting a hotel room (i.e. presence of a swimming pool, or paying a higher price), depending on the type of conjoint methodology used. A hotel room may not provide all attributes that a guest most prefers, so conjoint analysis enables researchers to calculate the importance of attributes on the basis of the trade-offs that are made (Lewis et al., 1991).

### *Types of Conjoint Analysis*

Conjoint analysis is 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). Its popularity is due, in part, to the fact that there is more than one conjoint analysis technique from which to choose, thus providing a tool appropriate for, and adaptable to, various types of research. The three most widely used are the traditional full-profile method, the adaptive conjoint method, and the choice-based approach (Hair et al., 2006; Orme, 2006). Which method is used primarily depends upon the research question, and the number of attributes used in the process. See Table 1 for a summary of each approach.

The traditional full-profile method, the first approach to be used by most researchers, typically incorporates between six and nine attributes, each with two or more levels (Green & Srinivasan, 1978; Hair et al., 2006; Orme, 2006). The product incorporating these attributes is called the full-profile because all attributes, albeit at different levels, are included in each profile. The respondents are then shown one product at a time in order to rank or rate it. “Showing one product at a time encourages respondents to evaluate products individually rather than in direct comparison with a competitive set of

*Table 1*

*A Comparison of Alternative Conjoint Methodologies*

Characteristic	Conjoint Methodology		
	Traditional	Adaptive	Choice-Based
	Conjoint*	Conjoint**	Conjoint***
Level of Analysis	Individual	Individual	Aggregate or Individual
Choice Task	Evaluating Full-Profile Stimuli One at a Time	Rating Stimuli Containing Subsets of Attributes	Choice Between Sets of Stimuli
Data Collection Format	Any Format	Generally Computer-Based	Any Format

*Note.* Upper limit on number of attributes: \* = 9, \*\* = 30, \*\*\* = 6. From *Multivariate Data Analysis* (p. 479), by J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson and R. L. Tatham, 2006, Upper Saddle River, NJ: Pearson Prentice Hall. Copyright 2006 by Pearson Prentice Hall.

products” (Orme, 2006, p. 34).

Adaptive conjoint analysis (ACA) became quite popular during the 1990’s and was developed primarily to deal with a large number of attributes, namely up to 30 (Hair et al., 2006; Orme, 2006). According to Hair et al. (2006), ACA is a “[m]ethodology for

conducting a conjoint analysis that relies on respondents providing additional information not in the actual *conjoint task* (e.g., importance of attributes). This information is then used to adapt and simplify the *conjoin task*” (p. 461). The survey actually adjusts itself as the respondent progresses through it. As a result, surveys designed using ACA must be administered via computer.

The choice-based approach, which may be conducted either via computer or via paper and pencil, presents respondents with a set of products from which they choose the one product most preferred, instead of ranking or rating them, as is done in the traditional method (Hair et al., 2006). The premise is to present respondents with real-life scenarios in which they are comparing two or more products, as they would in a grocery store, for example, before making a decision to purchase. The primary use of this approach is to predict product or service purchase.

The traditional, full-profile conjoint method was adopted for the present study because of the relatively small number of attributes, and because the primary purpose of this study to understand the acceptance of the attributes and the resulting product, rather than trying to predict purchase of the product. The conjoint analysis itself, in order to determine the combination of environmentally friendly room attributes that was most preferred by respondents, 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. These utility scores are analogous to regression coefficients in that they provide a quantitative measure of the preference for each factor level. Larger values correspond to greater preference. In the present study, factor levels

are the attribute levels. The scores then constitute a model for predicting the preference of any product profile. (SPSS, 2007).

### Sample

The targeted sample for this survey are travelers, both business and leisure, who have spent at least one night in a hotel in the previous 12 months. A business traveler is one who travels for business reasons, such as making sales calls, attending meetings, working trade-shows and other events, or visiting other branches of his/her business, and leisure travelers are those traveling for leisure purposes, such as vacation.

Travelers were randomly selected using an extensive database provided by the online research company Qualtrics. Qualtrics, based in Utah, was established in 1997. Qualtrics 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.

There is no strong agreement on appropriate sample size for conjoint studies (McCullough, 2002; Orme, 2006). “Little literature exists examining the impact of sample size on conjoint model error, but current evidence suggests that models can be reliably estimated with samples as low as 75, regardless of type of conjoint technique employed” (McCullough, 2002, p. 21). Others (Green & Srinivasan, 1990; Quester & Smart, 1998) claim that conjoint analysis requires a minimum sample of 100-200



respondents (Quester & Smart). Orme (2006) argues that the type of conjoint method dictates sample size. For example, a rule of thumb for choice-based conjoint is:

$$nta/c \geq 500,$$

where  $n$  is the number of respondents,  $t$  is the number of tasks,  $a$  is the number of alternatives per task (not including the *none* alternative), and  $c$  is the number of analysis cells. For the traditional conjoint method, as was used in the present study, Orme recommends 300 respondents, although there is no apparent statistical basis for that number.

Although there is no agreed upon statistical method for determining sample size that is specific to conjoint measurement studies, there are other techniques that are useful for determining sample size. One often-used method is that suggested by Churchill and Iacobucci (2005). Churchill and Iacobucci, as did Orme (2006), recognized that the research for determining sample size for ratings-based studies is minimal. As a result, they use methods that estimate variance. Churchill and Iacobucci suggest that ranges of variance for ratings scales will differ based on the number of scale points. In the present study, all scales will consist of seven points ranging from one to seven. In that case, Churchill and Iacobucci suggest a range of variances from 2.5 – 4.0. To determine appropriate sample size based on those ranges, the following formula is used:

$$n = (z^2 / H^2) * s^2$$

where,  $n$  = sample size;

$z$  =  $z$  value at a 95% confidence interval;

$H$  = Desired precision; and,

$s^2$  = variance

Based on that equation, the range of recommended sample sizes for the present study is:

$$n = 1.96^2 / .20^2 * 2.5 = 240 \text{ for the low end; and,}$$

$$n = 1.96^2 / .20^2 * 4.0 = 384 \text{ for the high end.}$$

Thus, the recommended sample size ranges from 240 respondents to 384. Churchill and Iacobucci recommend being conservative and using the variance estimate at or near the high end of the range.

A general rule of thumb for sample size in conjoint studies, in particular when comparing two or more groups, is to ensure that there are at least 200 respondents per group (Orme, 2006). The aim of the present study, therefore, was to assemble a total sample size of 600, based on the aforementioned calculations, with 300 responses each from business travelers and leisure travelers.

### Measurement

Various scales were utilized to assess respondent's importance placed on green attributes, environmental attitudes, as well as their preference for the green attributes as they are bundled into different green hotel rooms (scenarios). To measure the level of importance placed on having each individual green attribute in the room, a typical 7-point Likert scale was used, with 1 = very unimportant, 4 = neutral, and 7 = very important. The scale was adopted from previous research that assessed importance of attributes to travelers (Bowen & Shoemaker, 1998; Clow, Garretson, & Kurtz, 1994; Gunderson, Heide, & Olsson, 1996). Environmental attitudes of the travelers were analyzed using the New Environmental Paradigm (NEP) scale developed by Dunlap, Van Liere, Mertig, and Jones (2000), which rates environmental attitudes by asking respondents to rate their

level of agreement with environmental statements, on a scale of 1 – 5, where 1 = strongly disagree, and 5 = strongly agree. Finally, respondents rated their preference for an environmentally friendly hotel room 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 et al., 2006; Orme, 2006).

Dunlap and Van Liere (1978) developed the New Environmental Paradigm Scale that has become the most widely used scale to measure environmental attitudes or environmental concern (Dunlap, 2008; Stern, Dietz, & Guagnano, 1995). The scale, redeveloped in 2000 as the New Ecological Paradigm (NEP) Scale, consists of fifteen statements about the environment. The statements focus on attitudes about “reality of limits to growth, anti-anthropocentrism, the fragility of nature’s balance, rejection of exemptionalism and the possibility of an ecocrisis” (Dunlap et al., 2002, p. 432). The statements relating to the limits of growth recognize that there are limits in the ecosystem to growth. The traditional view of anthropocentrism claims that man is “above” nature, and that nature is there specifically for man’s use and exploitation (Weaver, 2001b). Anti-anthropocentrism goes against this view. Statements in the NEP also cover issues that put man and nature in balance and on an equal playing field. The rejection of exemptionalism refers to the fact that people no longer believe that humans are “exempt from the constraints of nature” (Dunlap, 2008, p. 432). Finally, some NEP statements recognize that the notion of an ecocrisis, such as global warming, is prominent today.

There are three statements addressing each facet within the NEP. For a list of statements and their corresponding facet, see Table 2. Eight of the items were worded so

*Table 2*

*The New Ecological Paradigm Scale*

Ecological Statement	Facet
We are approaching the limit of the number of people the earth can support*	Limits to growth
Humans have the right to modify the natural environment to suit their needs	Antianthropocentrism
When humans interfere with nature it often produces disastrous consequences*	Fragility of nature's balance
Human ingenuity will insure that we do NOT make the earth unlivable	Rejection of exemptionalism
Humans are severely abusing the environment*	Possibility of an ecocrisis
The earth has plenty of natural resources if we just learn how to develop them	Limits to growth
Plants and animals have as much right as humans to exist*	Antianthropocentrism
The balance of nature is strong enough to cope with the impacts of modern industrial nations	Fragility of nature's balance
Despite our special abilities humans are still subject to the laws of nature*	Rejection of exemptionalism
The so-called "ecological crisis" facing humankind has been greatly exaggerated	Possibility of an ecocrisis
The earth is like a spaceship with very limited room and resources*	Limits to growth
Humans were meant to rule over the rest of nature	Antianthropocentrism
The balance of nature is very delicate and easily upset*	Fragility of nature's balance

*Table 2 (continued)*

*The New Ecological Paradigm Scale*

Ecological Statement	Facet
Humans will eventually learn enough about how nature works to be able to control it	Rejection of exemptionalism
If things continue on their present course, we will soon experience a major ecological catastrophe*	Possibility of an ecocrisis

*Note:* \* Agreement with the statement indicates a pro-ecological view.

Source: Dunlap, Van Liere, Mertig, and Jones, 2000.

that agreement indicates a proecological view, and seven of them were worded so that disagreement indicates a proecological worldview” (Dunlap et al., 2000, p. 432).

Respondents rate their level of agreement with each statement using a 5-point Likert scale, where 1 = strongly disagree, 3 = neither agree nor disagree, and 5 = strongly agree.

The higher the score on the NEP scale, the stronger the pro-ecological view.

Several studies have assessed the underlying dimensions of the NEP scale. Dunlap and

Van Liere (1978) argue that the NEP scale is unidimensional. Unidimensionality

“assumes that only one trait or ability level is being measured by the various items

thatcompose a test or scale” (Henard, 2000, p. 97). Research trying to prove the scales

unidimensionality, however, has been met with mixed results (Lück, 2003). Albrecht,

Bultena, Hoiberg, and Nowak (1982) as well as Uysal, Jurowski, Noe and McDonald

(1994), using factor analysis, determined that the scale consisted of three dimensions.

Noe and Snow (1990) and Lück (2003) identified two factors, while Geller and Lasley (1985) identified four and five factors. Because there is a lack of agreement on dimensionality of the NEP scale, the present study follows Dunlap's (2008) advice and treats the scale as a unidimensional scale, initially, but then uses factor analysis once the data is collected to prove or disprove unidimensionality.

### Attributes and Relevant Levels

The relevant environmentally friendly attributes (characteristics of a green hotel room) in the present study were selected by combining results of a pilot study conducted to determine the most important green attributes for potential travelers, discussions with experts working within the hospitality arena, as well as attributes assessed in the two previous green attribute studies (Kasim, 2004; Watkins, 1994). The final attributes that were used are recycling policy (RP), shampoo amenities (SA), controlled lighting (CL), energy efficient light bulbs (EEB), towel policy (TP), linen policy (LP), and green certification (GC). 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 3.

### Scenarios

Creation of each scenario is conducted by way of experimental design. As Moskowitz and Krieger (2003) explain:

Experimental design, of which conjoint analysis is a domain unto itself, comprises the systematic variation of the stimuli (e.g. hotel concept design) on a variety of attributes

Table 3

*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

or independent variables. These variables, controlled by the experimenter (product developer, researcher, graphic designer) comprise known factors that can be mixed and matched in a way that produces realistic products or descriptions, but in which, and at the same time, the independent variables appear as ‘free agents’. (p. 269)

The stimulus in the present study is the green hotel room, with the green attributes acting as the independent variables. The attributes will be presented in various combinations in order to create hypothetical green hotel rooms, which, in turn, are the scenarios that will be presented to consumers. The number of possible scenarios, using a full factorial design, is 128 ( $2^7$ ), based on the seven environmental 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, so only a select number of scenarios will be presented to them. Orme (2006) recommends incorporating at least enough conjoint tasks, or scenarios, to reduce measurement error sufficiently. It is recommended that the survey incorporate enough questions to obtain three times the number of observations as parameters to be estimated, or a number equal to:

$$3(K - k + 1),$$

where  $K$  is the total number of levels across all attributes and  $k$  is the number of attributes (Orme). The number of levels in the present study is 14, with the number of attributes set at 7. Thus,

$$3(14 - 7 + 1) = 24.$$

Based on the above formula, 24 conjoint tasks, or scenarios, would be presented in the survey. Because 24 scenarios, in addition to other questions within the survey, may still produce respondent fatigue, another approach to producing a statistically adequate number of samples is to conduct a fractional factorial design. Fractional factorial design is an alternative to a full factorial design. "Its primary objective is to reduce the number



of evaluations collected while still maintaining *orthogonality* among the levels and subsequent *part-worth* estimates” (Hair et al., 2006, p. 462).

Orthogonality insures that there are no correlations among the different levels of each attribute. The fractional factorial design also insures that the stimuli are well balanced in that each level of each attribute appears the same number of times throughout the scenarios (Hair et al.). Orthogonality captures the main effects of the different factor levels, and assumes there are no interactions between the levels of one factor and levels of another factor (SPSS, 2007). A fractional factorial design was created using SPSS Conjoint 17.0. Each factor (attribute) was entered, along with its corresponding level, in order to generate the orthogonal array. A fractional factorial design can still produce any number scenarios. According to Xu and Yuan (2001), “It is generally perceived that if there are  $n$  attributes with an average of  $k$  levels, we need to have  $n(k - 1 + 1)$  parameters and the total number of profiles equals to about 1.5 times of the number of parameters” (p. 4). With seven attributes having two levels each in this study there would be eight parameters ( $7(2 - 1) + 1 = 8$ ), and thus, 12 scenarios. All of the scenarios are presented in Table 4.

Whether business or leisure travelers prefer the green attributes selected for the present study remains to be seen. Previous research has indicated that the primary attributes most travelers seek when selecting a hotel are cleanliness and location (Callan, 1996; Knutson, 1988). While those two attributes were not part of the analysis in the present study, they were used in the instructions of the experiment as a general description of a hotel room. The initial instructions for rating each scenario were as follows:

Table 4

*Twelve Scenarios Used in the Final Survey*

Attributes							
Scenario	RP	SA	CL	EEB	TP	LP	GC
1	Lobby	Dispenser	Key Card	No	Fresh	Changed upon Request	Yes
2	Room	Dispenser	Key Card	No	Reuse	Changed daily	No
3	Lobby	Dispenser	Sensor	Yes	Reuse	Changed daily	No
4	Lobby	Bottle	Key Card	Yes	Reuse	Changed upon Request	No
5	Room	Bottle	Key Card	Yes	Fresh	Changed upon Request	No
6	Lobby	Dispenser	Sensor	No	Fresh	Changed upon Request	No
7	Lobby	Bottle	Key Card	No	Reuse	Changed daily	Yes
8	Room	Dispenser	Key Card	Yes	Fresh	Changed daily	Yes
9	Lobby	Bottle	Sensor	Yes	Fresh	Changed daily	Yes
10	Room	Bottle	Sensor	No	Fresh	Changed daily	No
11	Room	Bottle	Sensor	No	Reuse	Changed upon Request	Yes
12	Room	Dispenser	Sensor	Yes	Reuse	Changed upon request	Yes

You are planning a trip on which you will need at least one night's hotel accommodation. Below are twelve scenarios of possible hotel accommodations for you to choose from. Each of the scenarios is a hotel room that contains a combination of environmentally friendly hotel room attributes and general attributes that hotels may offer. Assume that all unmentioned attributes (i.e. cleanliness, ideal location, etc.) are the same for each of the rooms. For each scenario, please rate your preference for the room, on a scale of 1 (not at all preferred) to 11 (extremely preferred).

After pre-testing the survey, however, on a number of faculty and graduate students at a major West Coast University, the instructions were changed to be less wordy. The new instructions, appearing on only the first scenario, were as follows:

The following pages contain combinations of environmentally friendly attributes that you might find in a hotel room.

Some of the attributes will change in each room.

Assume that all unmentioned attributes (i.e. cleanliness, ideal location, etc.) are the same for each of the rooms.

Please rate your preference, based on the group of attributes, for the room on a scale of 1 (not at all preferred) to 11 (extremely preferred).

Instructions on subsequent scenarios were simply:

Please rate your preference, based on the group of attributes, for the room on a scale of 1 (not at all preferred) to 11 (extremely preferred).

Attributes in red are different from the previous room.

To alleviate confusion about which attributes changed from scenario to scenario, at the request of those that pre-tested the survey, the attributes that did change between rooms appeared in red font.

Each scenario was presented on a different screen in the online survey. The text shown below is an example of how the scenario, along with instructions, appeared to survey participants:

The following pages contain combinations of environmentally friendly attributes that you might find in a hotel room.

Some of the attributes will change in each room.

Assume that all unmentioned attributes (i.e. cleanliness, ideal location, etc.) are the same for each of the rooms.

Please rate your preference, based on the group of attributes, for the room on a scale of 1 (not at all preferred) to 11 (extremely preferred).

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

After each scenario was a scale from 1 (not at all preferred) to 11 (extremely preferred) from which participants selected their level of preference.

## Survey Instrument

Construction of the survey incorporated the principles developed by Dillman, Tortora, and Bowker (1999): a motivational welcome screen; begin the survey with a question that fully appears on the screen and that all respondents can answer; present each question similar to how it would be presented in a traditional survey; limit the line length to minimize the need to scroll left to right; provide detailed instructions both at the beginning of the survey (how to take the survey), and at each stage of the survey as it changes; and, do not force respondents to answer every question. The survey itself included four sections: preference for specific green attributes; the scenario section; environmental attitude assessment; and, a socio demographic and behavior section.

The first section of the survey incorporated those questions pertaining to specific green hotel room attributes. Respondents to the survey were initially asked to rate the importance, to them, of having each individual attribute in a hotel guest room. Level of importance was rated using a typical 7-point Likert scale, with 1 = very unimportant, 4 = neutral, and 7 = very important. The primary purposes of this section are to both assess preference for the individual attributes and to also make respondents familiar with the environmental attributes that will be used in the scenarios presented later in the proposed survey. In addition, the importance placed on these attributes can in turn be compared as a validity check with the part-worth scores on each attribute in each scenario. The attributes are: recycling bins in guest room; recycling bins throughout hotel; linen re-use policy; refillable shampoo dispensers in guest bathroom; occupancy sensors in the guest room; towel re-use program; key cards that turn power to the room on upon entry into the room; energy saving light bulbs in the guest room; and, green hotel certification.

Section two presented the scenarios to the respondents. The respondents were given eight scenarios in total. Each scenario had a different combination of the green attributes. Respondents were then be asked rate their level of preference for each scenario, on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Section three of the survey assessed the environmental attitudes of each participant, using the NEP scale developed by Dunlap et al. (2000). The scale includes 15 statements, all relating to environmental issues, that respondents rate their level of agreement with. Level of agreement was rated on a scale of 1 = strong disagree, and 5 = strongly agree.

The last section of the survey incorporated basic socio demographic and behavior questions such as, age, gender, number of nights, on average, spent in hotels in a year, and type of hotel typically stayed in, in addition to environmentally friendly activities performed at home. Different surveys were created for business and leisure travelers. The differences between the two surveys are subtle but this step ensured that respondents consistently answered the questions from either a business traveler or leisure traveler's point of view. See Appendix A for a complete copy of the survey.

### Data Collection

The conjoint experiment was administered via an online survey. An Internet survey has several advantages: it enables the researcher to reach a large audience relatively quickly and inexpensively; changes to the survey design can be made easily if necessary; and, data entry is simplified (Granello & Wheaton, 2004; Zikmund, 2003).

Two primary advantages of electronic surveys are cost savings and lowered response time (Granello & Wheaton, 2004; Zikmund, 2003). Compared to mail, phone or face-to-face interviews, electronic surveys are less expensive because they save time (no stuffing envelopes, or interviewing people), and there are no mailing costs, traveling costs, or cost of paper and printing (Granello & Wheaton, 2004; Zikmund, 2003). While electronic surveys are not entirely free (there are costs for set up, administering, and selecting the database), they are inherently less expensive than more traditional methods. In addition, Granello and Wheaton (2004), and Bauman, Airey, and Atak (1998) found that most survey respondents complete a survey within 1 to 2 days of receiving the initial invitation versus a possible 4-6 weeks for mail surveys.

Another advantage to an Internet survey is that it can be visually appealing with various graphics and pictures, and thus, more interactive with the respondent. The end result may be less survey abandonment because the survey respondent will be more engaged with the survey itself. Also, the survey can be adjusted easily if need be (Dillman et al., 1999). Traditional surveys, once created, are difficult and expensive to change. A few keystrokes on a computer can change an electronic survey. The data entry process is also simplified with electronic surveys. The data is generally tracked and recorded by the web-based companies administering the survey, which eliminates this step for the researcher (Granello & Wheaton, 2004). Finally, electronic surveys provide researchers with quick-time data. They can view the results as they occur instead of having to wait for someone to enter the data.

Limitations of Internet surveys include the fact that the survey will only reach those participants that have access to a computer and the Internet; therefore the final sample

will not be representative of the entire population of travelers. In addition, there is the possibility of respondent misunderstanding, technical difficulty, and low response rates (Granello & Wheaton, 2004; Zikmund, 2003). The number of new users of the Internet in the United States is growing at a rate of 2 million per month (Granello & Wheaton, 2004). Even with such growth, however, a large part of the U. S. population still has no access to computers or the Internet. That part of the population is automatically eliminated from participating in any type of Internet survey. As a result, the generalizability of this study's results is compromised. To address that concern, it is the researchers responsibility to make sure that the targeted sample does have access to the Internet. It is assumed in the present study that the target populations of business and leisure traveler's do have equal access to the Internet, which enhances the generalizability of the results.

Response rates from email or web-based surveys tend to be lower than those for traditional mail surveys (Granello & Wheaton, 2004). It is often common, when using traditional mail surveys, for researchers to send follow-up reminders for people to complete the survey. To increase online response rates, a similar reminder can be sent, via email, to the sample population. Other tactics found to be successful in increasing response rates, according to Crawford, Couper and Lamias (2001) are when the length of the survey is mentioned in the initial email invitation (i.e., how much time it will take to complete), and when some form of password access is provided in the initial email (which ensures anonymity).

Technical difficulties are always possible when working with computers. In addition, not everyone participating in the survey will have access to the most recent technology



(Granello & Wheaton, 2004). As a result, the researcher must ensure that the survey can be downloaded easily, and that the formatting will work across multiple types of software and hardware. Formatting of the survey must also be easy to follow and pleasing to look at or the respondent may abandon it. Question design must be clear and easy to follow so that the respondent should not have any questions as to what the survey questions mean. It may be necessary to provide an example question and scenario first so that any ambiguity is cleared up.

### Reliability

In any study, the researcher must be concerned with reliability. Peter (1979) enunciates: “Not only is reliability a necessary condition for validity, but unreliable measures attenuate [lessen] the correlation between measures” (p. 6). Reliability of a study is concerned with the extent to which the measurement used in the study can produce the same results each time it is used, often referred to as repeatability, with minimal error (Zikmund, 2003). If the results are the same, then the measurement tool is reliable and consistent, and we can trust it (Strube, 2000). Other common terms that are often used to describe reliability are consistency and generalizability. Generalizability, which is very similar to external validity, refers to whether or not the observations can be applied to, or inferred upon, the entire population of the target sample, such as business or leisure travelers. If the measurement tool used in a study does not produce reliable results, it is difficult to trust “the observations to provide insights into human behavior...” (Strube, 2000, p. 23).

One common method for testing reliability is the test-retest method, or conducting the test twice using the same measurement tool, under the same conditions, with the same respondents. If the results are the same after each test, the measurement tool is considered reliable. If they are different, however, the measure is said to have error and thus, is not repeatable (Zikmund, 2003). Tests-retests, however, are difficult to administer because once respondents complete the first test, they then become familiar with it, which may affect their responses to the second test. Respondent's attitudes or opinions may also change between when the first and second tests are administered. It may also be difficult to obtain all of the same respondents for the second test. All of these issues will result in lower reliability scores for the measurement tool.

Another form of assessing reliability is to test for internal consistency. Internal consistency refers to the homogeneity of the measure (Zikmund, 2003). It is "the degree that all individual scale items within a measure are collectively capturing the construct of interest" (Henard, 2000, p. 94). The split-halves method is most commonly used to test internal consistency. This method splits the observations received during the study in half and the scores are then correlated. In essence, the results of one half of the scale items are compared to the other half. The resulting reliability coefficient between the two halves determines internal consistency. Cronbach's coefficient alpha is the most widely used formula for assessing the reliability of a measurement scale (Peter, 1979), such as the scales used in the present study. Reliability of the NEP scale has already been tested and confirmed in several studies (Lück, 2003).

Alternative form reliability, also called the equivalent-form method (Peter, 1979; Zikmund, 2003) is another form used to test reliability. Two different measurement

instruments, intended to measure the same constructs, are administered to the same group of subjects at two different times. The scores from each measurement are then correlated in order to obtain a reliability coefficient.

In terms of conjoint studies, as Orme (2006) suggests, “reliability is often characterized in terms of *R*-squared (percent of total variance in the product ratings explained by the model) for ratings-based conjoint methods, or likelihood if considering choice-based models” (p. 148). It measures the consistency with which respondents assign ratings to each scenario or task. In this dissertation, *R*-squared was used to assess reliability for the conjoint measurement, while Cronbach’s Alpha was used to assess reliability for the other measurements.

To enhance reliability, Strube (2000) recommends that respondents to the intended study be given the same directions, delivered in the same format, before the introduction of each survey measure. Each respondent should also have the same amount of time within which to complete the survey. These two basic steps help to standardize the results and reduce error, which in turn enhances reliability. Strube also recommends reducing error, or improving reliability, by aggregation, which is “the statistical principle in which random error is suppressed through replication (e.g., test items, raters, or occasions)” (p. 61). Instead of using just one question, for example, to determine whether a traveler prefers a specific type of room, multiple questions will be administered in order to answer that question. The idea is that the more similar measures there are that measure the object or construct of interest, the more the random errors will be able to cancel each other out, which results in a more reliable measure.

## Validity

According to Leedy and Ormrod (2001), a measurement instrument is valid if it measures what it is supposed to measure. Measurement of validity comes in many forms. Two such forms are content validity, which subjectively assesses the correspondence between the individual items and the concept through ratings by expert judges, pretests with multiple sub-populations, or other means” (Hair et al, 2006, p. 136), and face validity, which is consensus from professions that a scale measures what it is supposed to measure. In this dissertation, content validity was assessed by presenting an extensive list of environmentally friendly attributes that may be incorporated into a hotel room to experts working in the hospitality industry as well as experts already familiar with such attributes. The respondents included hotel workers, faculty and students familiar with environmental issues, as well as former guests of environmentally friendly hotels. The list was initially comprised by combining attributes identified in previous studies with attributes identified by the AH&LA. All were attributes that hotels are currently using. Respondents were asked to identify the top five attributes they believe are most important to have in a hotel room, or to list any other attributes that were not included in the list. The majority of the respondents identified a towel re-use program, energy efficient lighting, occupancy sensors to control lighting, refillable shampoo dispensers, and key cards that control power to the room as the top five most important attributes.

Content validity was further assessed by administering the same list in a survey to attendees of a hotel developer’s conference that was focused on greening the hospitality industry. The purpose of the survey was to obtain further clarification of the environmentally friendly attributes that should be used in the present study. The majority

of the attendees were either hotel developers or architects that were already familiar with green hotel attributes. They were asked to rate their level of agreement, on a scale of 1 (strongly disagree) to 7 (strongly agree) of having particular green attributes in a room. The means and standard deviations of their preferences are presented in Table 5. Lighting received the top two highest scores, followed by a towel re-use program, recycling bins in the guest room, and sheets changed upon request only.

The list of rated attributes was compared with the list obtained from the initial group of experts. Although some attributes received relatively high mean scores by the hotel developers (e.g., low flow toilets or faucets), they were not attributes identified by the experts. To obtain an overall list that was not too lengthy, those attributes were therefore not included in the final list of attributes used in this study. Two of the attributes that received the lowest scores, refillable soap dispenser and low flow showerheads were also excluded from the final list. A refillable shampoo dispenser, however, remained on the list because it was one attribute also identified by the faculty and industry experts. Combining the expert's results with the conference attendee's results preferences produced the final list of attributes to be used in the present study. Once the list was comprised, other experts (different faculty, as well as green architects) in the field were asked to assess it for face validity, or if the attributes in the present study seem valid and realistic enough to help measure whether a survey respondent would likely choose to stay in an environmentally friendly hotel room. Those experts agreed that the attributes are realistic, and thus, both content and face validity were satisfied in this study. A number of researchers (Albrecht et al., 1982; Dunlap & Van Liere, 1978; Lück, 2003; Noe & Snow, 1990; Uysal et al., 1994) have also already deemed the NEP scale both

*Table 5*

*Means and Standard Deviations for Environmentally Friendly Room Attributes*

Environmental Attribute	Mean Score	Standard Deviation
Energy Saving Bulbs/Sleeping	6.42	1.31
Energy Saving Bulbs/Bathroom	6.37	1.31
Towel Re-use program	6.35	1.43
Recycling bins in guest room	6.30	1.42
Sheets changed upon request only	6.26	1.47
Occupancy Sensors	6.23	1.46
Low flow toilets	6.17	1.47
Key cards for power to the room	6.16	1.46
Low Flow Faucets	6.08	1.50
Refillable soap dispensers	5.18	1.98
Refillable shampoo dispensers	5.12	1.99
Low Flow Showerheads	5.04	2.12

*Note.* Scale values are 1 – strongly disagree, 2 – moderately disagree, 3 – disagree, 4 – neutral, 5 – agree, 6 – moderately agree, and 7 – strongly agree.

reliable and valid for testing environmental attitudes.

External and internal validity are two other types of validity that are important in an experimental design. Internal validity is concerned with whether the treatment (independent variable) was the only cause of any change in the dependent variable. If the dependent variable changes for any other reason than the application of the treatment, internal validity is compromised. With strong internal validity, we know that the treatment did in fact cause the effect. Internal validity was tested and reported using Pearson's correlation, which is based on the "correlation between the input versus estimated values of the dependent variable" (Green & Srinivasan, 1978, p. 8).

External validity is concerned with the extent to which the results of the study can be generalized to other contexts and to other groups in the population under study, which, in this case is business and leisure travelers. It is difficult to control in an experimental setting, especially when the setting would be considered somewhat "artificial", as in this dissertation. To enhance external validity, one approach to take is to try to create a "real-life" setting (Leedy & Ormrod, 2001), such as the variety of that are scenarios involved in conjoint studies and used in this dissertation.

Construct validity is generally comprised of convergent, discriminant and nomological validity, and refers to the accuracy of the measurement tool. Construct validity is affirmed when the measurement tool correlates appropriately with other measurements used to measure the same construct, and when it has been proven accurate when measuring other concepts based on prior research. Specifically, convergent validity refers to the extent to which the measurement is correlated with similar measures of the same concept (i.e., correlations should be high), while discriminant validity refers to the

extent to which the measurement is different from other scales used to measure the concept (i.e., correlations should be low) (Hair et al., 2006). Nomological validity “determines whether a scale demonstrates the relationships shown to exist based on theory or prior research” (Hair et al., p. 138).

Convergent and discriminant validity were assessed by taking the scores of a sample of respondents for each measure and running a correlation analysis between them and the scores for all of the other measures. High correlation will indicate that the measures are indeed measuring the same thing, while low correlations will indicate that the measures are appropriately measure different concepts.

### Data Analysis

Several statistical methods were used to analyze the data. Frequencies, means and standards deviations were run for all demographic data, as well as the importance placed on the individual environmental attributes. The conjoint analysis itself involves methods similar to regression analysis (SPSS, 2007). The procedure produced utility scores, which are more commonly referred to as part-worths, for each environmentally friendly attribute level (i.e. fresh towels or occupancy sensors). These utility scores, are similar to regression coefficients and provide a value for the preference for each factor level. Greater preference corresponds with higher values. In this study, factor levels were the attribute levels. The utility scores are then used a model for predicting the preference of any product profile. Because there are 14 attribute levels (7 attributes with 2 levels each), 14 utility scores were produced. The highest score among the attribute levels indicated that that attribute was the most influential in overall preference for the environmentally



friendly room. The utility scores also indicated which level of each attribute the respondents preferred. The final result was an overall combination of environmentally friendly attributes preferred in a hotel room. These results will address research questions R1 and R1, and hypothesis H1.

In order to test the remaining hypotheses, which assess how the various socio demographic characteristics affected preference for the environmentally friendly room attributes, a series of one-way analysis of variance (ANOVA) and independent samples t-tests were conducted on each environmentally friendly attribute. The assumptions involved in using ANOVA were verified in this dissertation.

Individual attributes were used as opposed to the overall “room” so that a clear picture of who preferred what type of attribute could be produced. Different types of customers may perceive each attribute at a different importance level than others (Siomkos, Vasiliadis, & Lathiras, 2006). A hotel room, or hotel in general, will not incorporate just green attributes. It will incorporate many other factors as well, such as a comfortable bed, soft towels, or cleanliness. By understanding the importance placed on each attribute alone, along with the effect of socio-demographic characteristics, management can have a better indication of the specific environmentally friendly attributes that are most important to different individuals, and merge them with other hotel attributes.

### Summary

This chapter presented the research methodology involved in this dissertation. The chapter began with a discussion first about conjoint analysis, followed by sample size,

and measurement scales. Creation of the scenarios for the conjoint study was then discussed in detail. The chapter continues with discussions of reliability and validity. Finally, data collection methods were addressed along with data analysis methods in the last section. The results of the data analysis are presented in the following chapter.

## CHAPTER IV

### ANALYSIS AND RESULTS

#### Introduction

This chapter presents the analysis and hypotheses testing and the corresponding results. The first section of the chapter discusses the respondent selection procedure conducted by the online survey company, followed by the demographic profiles and descriptive statistics for business and leisure travelers respectively. Section two of the chapter presents the results of the conjoint analysis. Section three of the chapter starts with an assumption check for one-way analysis of variance, then follows with the results of the hypotheses testing. The chapter concludes with reliability and validity assessments.

#### Selection of Respondents

The targeted sample size for this dissertation was 300 business travelers, and 300 leisure travelers. Participants were selected from an extensive database of panel members provided by Qualtrics, an online survey company. Below is an overview of how Qualtrics selects its panel members:

##### Recruitment Overview

**Proprietary Recruitment:** We work through a variety of websites to identify potential

respondents. On these websites we have embedded our recruitment portals to collect information of those who would be interested in belonging to the panel. The diversification of these websites helps us to ensure we recruit individuals with varied backgrounds and interests that truly represents the population.

**Invitation Only:** Each individual is evaluated and then sent an invitation before becoming part of the panel. This invitation method gives us more opportunity to know who we are recruiting and screen out potential professional panelists.

**Double Opt-In Recruitment:** All individuals must go through the double opt in procedure to verify and profile demographics, firmographics, and psychographics are collected. These profiles are then used to target specific populations within the panel, and give more accurate samples for specific research. The panel is continually monitored, and problem respondents are flagged and permanently blocked.

#### Sample Selection

General population samples are drawn from the main panel through a selection process that takes into account US census data, and response rates of demographic groups. The goal of selection is to produce a representative answering sample.

Weighting is based off of US census data, however, lower responding groups - such as males - receive more weight to ensure that the responding sample is representative.

(R. Boyer, personal communication, March 23, 2009)

Once Qualtrics administered the survey to its panel members, 1116 of the 1323 panel members contacted responded to the invitation email, and clicked on the survey to take it. Once respondents began the survey and answered a series of demographic questions, they were presented with some screening questions. The first screening question asked if the

respondent would consider staying in an environmentally friendly hotel. If not, they were terminated from the rest of the survey. If yes they were asked if they had spent at least one night in a lodging facility for business travel within the past 12 months, or if they had spent at least one night in a lodging facility for leisure travel within the past 12 months. Those that answered “yes” to either of those questions continued with the rest of the survey. Those that answered “no” to both questions were terminated from the survey. In total, 606 travelers completed the survey, resulting in a 46% response rate. The final mix included 305 business traveler respondents, and 301 leisure traveler respondents.

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 environmental attitudes and scenarios that the respondents were asked to rate. The business traveler data yielded 21 cases where the respondent rated either every attitude or scenario exactly the same. For example, one respondent rated all scenarios with 11, which is extremely preferred. To enhance the validity of the overall preference structure, those cases were deleted (Hair, Black, Babin, Anderson, & Tatham, 2006). Seventeen cases were deleted from the leisure traveler responses for the same reason. Other than the irregular responses to the scenario questions, no missing or unrealistic responses were detected. 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 6). The age of the

*Table 6*

*Demographic Profile of Travelers*

Demographic Category		Business Travelers		Leisure Travelers	
		n = 284		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

*Table 6 (Continued)*

*Demographic Profile of Travelers*

		Business Travelers		Leisure Travelers	
		n = 284		n = 287	
Demographic Category		Number	%	Number	%
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

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.

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. Business travelers are typically males between their mid-thirties and mid-forties (Mintel International Group Limited, 2007; U. S. Department of Transportation, 2003). Income is relatively high (\$75,000 or more annually) as is their education level (under-graduate degree or higher). 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 dissertation, 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. This is considerably lower than that identified by the AHLA.

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. Although the age distribution is similar to that of this dissertation, annual household income is not. Leisure travelers earn an annual household income of \$77,100, according to the AHLA. That is much higher than the respondents herein.

The AHLA does not provide detail about gender demographics of the leisure traveler so the gender demographic characteristics of leisure travelers in this dissertation were



thus compared to the U. S. population in general. Comparisons were made to the most recent U. S. Census Bureau's statistics, which are from 2000. At that time, 51% of the population was female. In this dissertation, 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 travelers. In this study, 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). Direct comparisons, again, are difficult for marital status because the questions and corresponding responses are framed differently. Slightly more than half of the U. S. population is married, as was the case in the present study.

In summary, the sample in this dissertation is representative of the U. S. population because it is consistent with the U. S. census data for 2000. It is noted, however, that these results still cannot be generalized to the overall population of business and leisure travelers.

### *Behavior Profile*

More than half (59%) of the business travelers had spent one to five nights in a lodging facility within the past 12 months (see Table 7 for a summary of results). When thinking about the type of lodging facility they had typically stayed in, the business travelers indicated a mid-priced lodging facility most often (43%). Twenty six percent indicated full service properties while 22% typically stayed at economy service hotels.

*Table 7*

*Behavior Profile of Travelers*

Characteristic	Business Travelers		Leisure Travelers	
	Number	%	Number	%
<b>Number of nights spent in a lodging facility in past 12 months</b>				
1-5 nights	166	58.5	177	61.7
6-10 nights	65	22.9	75	26.1
11-15 nights	26	9.2	20	7.0
16-19 nights	10	3.5	7	2.4
> 19 nights	17	6.0	8	2.8
<b>Total</b>	<b>284</b>	<b>100.0</b>	<b>287</b>	<b>100.0</b>
<b>Type of lodging facility typically stayed in</b>				
Economy	61	21.5	59	20.6
Mid-Priced	121	42.6	123	42.9
Full service	74	26.1	53	18.5
Luxury/Resort	28	9.9	45	15.7
Other	0	0	7	2.4
<b>Total</b>	<b>284</b>	<b>100.0</b>	<b>287</b>	<b>100.0</b>
<b>Environmentally Friendly Activity*</b>				
Recycle Cans and bottles	242	85.2	239	83.3
Use energy efficient light bulbs	234	82.4	233	81.2
Re-use plastic bags	233	82.0	245	85.4
Recycle paper and cardboard	212	74.6	184	64.1
Use low-flow water fixtures	113	39.8	96	33.4
Use cloth grocery bags	106	37.3	98	34.1
Buy organic groceries	77	27.1	51	17.8

All but three of the business traveler respondents performed at least one environmentally friendly activity at home. The most popular were recycling cans and bottles (85%), using energy efficient light bulbs (82.4%) and re-using plastic bags (82%). The activities with the fewest responses were using cloth grocery bags (37%) and buying organic groceries (27%). Several participants also indicated, in response to an open-ended question, that they perform other environmentally friendly activities at home. The most often cited activity was unplugging appliances when not in use, then composting, followed by using energy saving appliances, turning air conditioning or heating down, and reusing everything possible, such as paper, water, or towels.

Most of the leisure travelers (62%) had spent between one and five nights in a hotel in the past 12 months, while only 26% of them had spent between six and ten nights. The type of lodging facility the travelers typically stayed in within the past 12 months was a mid-priced hotel (43%). The next popular hotel-type was the economy category (21%) and the full service category (19%). All but four of the respondents indicated that they do perform environmentally friendly activities at home. Eighty five percent of them re-use plastic bags, and 83% of them recycle cans and bottles. The use of energy efficient light bulbs was the next most popular activity (81%). As was the case with business travelers, buying organic groceries was the least popular (18%). Composting was the most common activity for those respondents who listed other activities performed at home, along with buying in bulk, conserving electricity by unplugging appliances, using energy efficient appliances, and re-using as many items as possible.

A total of all activities for each respondent was calculated in order to create an index to be used to test the hypothesis that the more environmentally friendly activities performed

at home the greater the preference for each green attribute. There were seven activities, plus an “other” category, that respondents could select. The frequencies for both types of travelers are presented in Table 8.

*Table 8*

*Frequencies of Environmentally Friendly Activities Performed at Home*

	Business Travelers		Leisure Travelers	
	Frequency	%	Frequency	%
0 Activities	3	1.1	4	1.4
1 Activity	10	3.5	12	4.2
2 Activities	23	8.1	23	8.0
3 Activities	40	14.1	55	19.2
4 Activities	78	27.5	87	30.3
5 Activities	51	18.0	59	20.6
6 Activities	58	20.4	31	10.8
7 Activities	21	7.4	16	5.6
Total	284	100.0	287	100.0

### Willing to Pay

Business and leisure travelers indicated that they were willing to pay less, the same, or more for an environmentally friendly hotel room (See Table 9). If they were willing to pay less or more, they were then asked how much less or more, either 5%, 10%, or 15%. Seventy eight percent of the business travelers, and 84% of the leisure travelers indicated

that they were willing to pay the same. Of the business travelers, 18% indicated they would pay more while roughly 5% said they would pay less. Roughly 10% of the leisure travelers said they would pay more, while 6% indicated they would pay less.

*Table 9*

*Business and Leisure Travelers and Willing to Pay for an Environmentally Friendly Hotel Room*

		Business		Leisure	
		Frequency	Percent	Frequency	Percent
Willing To Pay	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	.4	5	1.7
	10%	4	1.4	5	1.7
	15%	8	2.8	8	2.8
How Much More**	5%	17	6.0	10	3.5
	10%	26	9.2	14	4.9
	15%	8	2.8	4	1.4

*Note.* \* Shows only those respondents who selected “how much less”.

\*\*Shows only those respondents who selected “how much more”.

## Environmental Attitudes of Business and Leisure Travelers

Eight of the environmental attitude questions are structured so that agreement to the statements represents a pro-ecological viewpoint, while seven questions are structured so that a pro-ecological viewpoint is represented by disagreement with the statement. In order to assess internal consistency, however, these values were re-coded so that all high scores have the same meaning (Norusis, 2005). In this case, this indicates a higher mean value represents a higher pro-ecological attitude. The overall mean for business travelers was 3.44 while for leisure travelers it was 3.18. The possible range of responses was from one to five, with three representing “neither agree or disagree”. Based on comparisons to previous studies utilizing the NEP scale, these mean scores are considered low (Lück, 2003). A mean score greater than four would represent a strong pro-ecological view. A summary of business and leisure travelers’ environmental attitudes is presented in Table 10.

## Demographic Hypotheses

The individual attribute importance scores, calculated previously, were used to test for mean differences in attribute preference and the socio demographic characteristics of the respondents. A series of analysis of variance (ANOVA) tests were conducted to detect any significant mean differences between age groups, income groups, and education groups and the green attributes. Analysis of variance has several assumptions that must be met before the statistical test is conducted. The first is related to the sample in that it must be random and independent. There is no relationship between the observations in the different groups in this dissertation so this assumption is met. The

*Table 10**Business and Leisure Travelers' Mean Values for the Revised NEP Scale (5-Point Scale)*

Ecological Statement	Business Travelers		Leisure Travelers	
	N = 284		N = 287	
	M	SD	M	SD
We are approaching the limit of the number of people the Earth can support	3.13	1.06	3.14	1.10
Humans have the right to modify the natural environment to suit their needs*	3.19	1.03	3.29	1.06
When humans interfere with nature it often produces disastrous consequences	3.88	0.901	3.71	0.929
Human ingenuity will insure that we do NOT make the earth unlivable*	2.90	0.999	2.97	0.936
Humans are severely abusing the environment	3.88	0.950	3.84	1.01
The earth has plenty of natural resources if we just learn how to develop them*	2.22	0.937	2.25	1.01
Plants and animals have as much right as humans to exist	4.14	0.732	4.08	0.972
The balance of nature is strong enough to cope with the impacts of modern industrial nations*	3.61	0.965	3.52	0.931
Despite our special abilities humans are still subject to the laws of nature	4.11	0.732	4.10	0.693
The so-called "ecological crisis" facing humankind has been greatly exaggerated*	3.36	1.06	3.37	1.09
The earth is like a spaceship with very limited room and resources	3.38	3.70	3.25	0.974

*Table 10 (continued)*

*Business and Leisure Travelers' Mean Values for the Revised NEP Scale (5-Point Scale)*

Ecological Statement	Business Travelers		Leisure Travelers	
	N = 284		N = 287	
	M	SD	M	SD
Humans were meant to rule over the rest of nature*	3.15	1.17	3.20	1.17
The balance of nature is very delicate and easily upset	3.70	0.943	3.60	0.922
Humans will eventually learn enough about how nature works to be able to control it*	3.27	1.05	3.21	1.00
If things continue on their present course, we will soon experience a major ecological catastrophe	3.64	0.990	3.59	1.04
Overall Mean	3.44	0.542	3.18	0.506

*Note.* \*Items were reverse-coded for analysis.

second is related to normal distribution of the population, which was checked with histograms. Violation of this assumption is generally acceptable if the sample size is greater than 30 (Hair et al., 2006); however, histograms indicated a good fit for the present study. Levene's test of homogeneity checks the third assumption, which is whether the population variances are equal. If variances are not equal, the Levene significant level will be less than 0.05. In this dissertation, most variances were assumed equal based on a Levene significant value greater than 0.05 for all ANOVA analyses. As



a result, the Bonferroni multiple comparison post-hoc test was used to determine where significant differences existed within each group. If variances were equal, the Tamhane multiple comparison post-hoc test was used instead of the Bonferroni (Hair et al., 2006). The last assumption check for ANOVA is for outliers. There were none in this dissertation.

Because a series of ANOVA tests were conducted for each attribute, the overall alpha level was adjusted in order to reduce Type I error. Type I error occurs when the null hypothesis has been falsely rejected (Hair et al., 2006; Licht, 1995). As Cohen and Cohen (1983) clarify, a Type I error is “finding things that are not there” (p. 166). There are several different methods for adjusting the alpha level in ANOVA procedures. One of the most common is the Bonferroni method (Licht, 1995). The Bonferroni method typically divides the overall desired alpha level, which was 0.05 in this case, by the number of individual ANOVA tests to be conducted (Hair et al., 2006; Licht, 1995). This provides the alpha level for each hypothesis. In this study, there were nine ANOVA tests for each hypothesis. Therefore, the adjusted significance level was 0.006 ( $0.05 / 9 = 0.006$ ) and Type 1 error was minimized.

#### Business Travelers Demographic Hypothesis Testing

A summary of the socio-demographic hypotheses is presented in Table 11. The ANOVA results for business travelers’ average preference for green attributes, grouped by age, are presented in Table 12. No significant differences were found between the age groups and the environmentally friendly attributes. These findings do not support hypothesis H1<sub>a</sub>.

Table 11

*A Summary of Socio-Demographic Hypotheses*

---

Research Hypotheses	
H1	Average preference scores for green attributes will differ due to age.  H1 <sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to age.  H1 <sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to age.
H2	Average preference scores for green attributes will differ due to gender.  H2 <sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to gender.  H2 <sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to gender.
H3	Average preference scores for green attributes will differ due to income.  H3 <sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to income.  H3 <sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to income.
H4	Average preference scores for green attributes will differ due to education.  H4 <sub>a</sub> = Average preference scores of green attributes for business travelers will differ due to education.  H4 <sub>b</sub> = Average preference scores of green attributes for leisure travelers will differ due to education.

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*Table 12*

*Means, Standard, Deviations, and ANOVA results of Individual Attributes for Business Travelers Due to Age*

Attribute	Age Group					Total	F-Score	P-Value
	29 or Younger	30 – 39	40 – 49	50 or Older				
Bin in Lobby	5.81 (1.39)	5.65 (5.49)	5.38 (1.58)	5.33 (1.56)	5.52 (1.52)	1.57	0.198	
Bin in Room	5.30 (1.72)	5.49 (1.61)	4.95 (1.67)	5.15 (1.66)	5.20 (1.67)	1.37	0.251	
Dispenser	4.52 (1.78)	4.45 (1.83)	4.70 (1.86)	4.34 (1.77)	4.51 (1.81)	0.521	0.668	
Sensor	5.00 (1.88)	5.43 (1.35)	5.16 (1.47)	5.21 (1.63)	5.20 (1.59)	0.816	0.486	
Key Card	4.98 (1.66)	5.40 (1.32)	5.15 (1.46)	4.89 (1.46)	5.10 (1.75)	1.393	0.245	
Bulbs	5.28 (1.62)	5.45 (1.54)	5.35 (1.59)	5.51 (1.60)	5.40 (1.57)	0.276	0.842	
Towel Re-Use	5.67 (1.42)	5.62 (1.49)	5.41 (1.59)	5.36 (1.53)	5.50 (1.51)	0.706	0.549	
Sheets on Request	5.48 (1.60)	5.69 (1.66)	5.61 (1.37)	5.56 (1.45)	5.59 (1.51)	0.216	0.885	
Green Certified	4.86 (1.62)	4.97 (1.60)	4.74 (1.62)	5.10 (1.50)	4.91 (1.58)	0.687	0.561	

*Note.* Number in parentheses represent the standard deviation for each of the variables measured. The measurement scale ranged from 1 to 7.

Women rated all of the attributes with a higher mean score than did the men. Results of an independent samples t-test, however, summarized in Table 13, indicated significant differences between men and women in only the recycling policy (bins in lobby and bins in room), energy efficient light bulbs, towel re-use, and sheets changes upon request only. Based on these findings, hypothesis H2<sub>a</sub> is partially supported.

As was the case with age, the average attribute preference scores due to income and education were not significantly different. Therefore, hypotheses H3<sub>a</sub> and H4<sub>a</sub> are not supported. Tables 14 and 15 summarize the results of the ANOVA tests for income and education, respectively.

*Table 13*

*Means, Standard Deviations, and T-test Results of Individual Attributes for Business Travelers Due to Gender*

Attribute	Gender		t-Score	P-Value
	Male	Female		
Bin in Lobby	5.19 (1.58)	5.99 (1.31)	4.54	0.000*
Bin in Room	4.92 (1.69)	5.60 (1.56)	3.48	0.001*
Dispenser	4.37 (1.70)	4.70 (1.93)	1.51	0.132
Sensor	5.02 (1.60)	5.44 (1.53)	2.20	0.029
Key Card	4.96 (1.48)	5.30 (1.64)	1.85	0.065
Bulbs	5.15 (1.59)	5.75 (1.47)	3.25	0.001*
Towel Re-Use	5.28 (1.46)	5.81 (1.53)	2.90	0.004*
Sheets on Request	5.30 (1.54)	5.98 (1.37)	3.92	0.000*
Green Certified	4.85 (1.56)	5.00 (1.62)	0.79	0.430

*Note.* Bonferroni adjustment was used for all independent samples t-tests. The *p*-values with \* are significant at the adjusted significance level of 0.006 ( $0.05/9 = 0.006$ ). Numbers in parentheses represent the standard deviations for each variable. Scale measurement was 1 to 7.

Table 14

*Means, Standard Deviations, and ANOVA Results of Individual Attributes for Business Travelers, Due to Income*

Income Group	Bin in Lobby	Bin in Room	Shampoo Dispenser	Occupancy Sensor	Key Card	Bulbs	Towel	Sheets on Request	Green Certified
< \$35,000	5.57(1.56)	5.53(1.63)	4.91(1.77)	5.43(1.68)	5.34(1.66)	5.60(1.57)	5.64(1.54)	5.87(1.53)	5.19(1.54)
\$35,001 - \$55,000	5.83(1.32)	5.52(1.58)	4.63(1.80)	5.38(1.40)	5.11(1.54)	5.73(1.40)	5.60(1.53)	5.70(1.43)	5.06(1.47)
\$55,001 - \$75,000	5.63(1.47)	5.06(1.56)	4.40(1.83)	4.93(1.70)	5.04(1.63)	5.15(1.55)	5.50(1.37)	5.41(1.53)	4.82(1.72)
\$75,001 - \$95,000	5.09(1.67)	4.66(1.63)	4.30(1.84)	5.07(1.74)	5.11(1.35)	5.00(1.73)	5.16(1.71)	5.41(1.66)	4.66(1.63)
> \$95,000	5.05(1.70)	4.68(1.58)	4.16(1.77)	5.14(1.46)	4.86(1.60)	5.30(1.66)	5.51(1.46)	5.49(1.43)	4.68(1.58)
Overall average	5.52(1.52)	4.91(1.58)	4.51(1.81)	5.20(1.59)	5.10(1.56)	5.40(1.57)	5.50(1.51)	5.59(1.51)	4.91(1.58)
F-score	2.824	2.859	1.249	1.105	0.512	2.391	0.756	0.979	1.092
P-value	0.025	0.024	0.290	0.354	0.727	0.051	0.555	0.419	0.361

Note. Bonferroni adjusted alpha was used for all ANOVA tests (0.05/9 = 0.006). Numbers in parentheses are the standard deviations for each of the variables measured. Numbers not in parentheses are the mean scores for each variable.

Table 15

*Means, Standard Deviations, and ANOVA Results of Individual Attributes for Business Travelers, Due to Education*

Education	Bin in	Bin in	Shampoo	Occupancy	Key Card	Bulbs	Towel	Sheets on	Green
Group	Lobby	Room	Dispenser	Sensor			Re-Use	Request	Certified
High School or less	5.68(1.29)	5.27(1.56)	4.86(1.80)	5.14(1.38)	5.32(1.38)	5.43(1.52)	5.16(1.71)	5.51(1.56)	5.16(1.71)
Some college	5.52(1.71)	5.35(1.70)	4.42(1.92)	5.27(1.63)	5.16(1.62)	5.29(1.67)	5.65(1.52)	5.60(1.61)	5.65(1.52)
Associates Degree	5.69(1.49)	4.98(1.81)	4.52(1.66)	5.14(1.65)	4.98(1.65)	5.36(1.71)	5.26(1.77)	5.60(1.61)	5.26(1.77)
Bachelors Degree	5.55(1.37)	5.17(1.61)	4.25(1.79)	5.12(1.64)	4.93(1.50)	5.42(1.53)	5.59(1.22)	5.61(1.35)	5.59(1.22)
≥ Graduate Degree	5.09(1.65)	5.12(1.69)	4.97(1.65)	5.33(1.53)	5.30(1.63)	5.64(1.27)	5.58(1.56)	5.58(1.50)	5.58(1.56)
Overall Average	5.52(1.52)	5.20(1.67)	4.51(1.81)	5.20(1.59)	5.10(1.56)	5.40(1.57)	5.50(1.51)	5.59(1.51)	5.50(1.51)
F-score	0.891	0.404	1.380	0.180	0.680	0.306	1.041	0.030	1.356
P-value	0.470	0.806	0.241	0.948	0.607	0.874	0.386	0.998	0.249

*Note.* Bonferroni adjusted alpha was used for all ANOVA tests (0.05/9 = 0.006). Numbers in parentheses are the standard deviations for each of the variables measured. Numbers not in parentheses are the mean scores for each variable.

## Leisure Traveler Demographic Hypothesis Testing

The ANOVA results for leisure travelers' preference for green attributes, grouped by age, are presented in Table 16. No significant differences were found between each attribute and the age groups. Therefore hypothesis H1<sub>b</sub> is not supported.

Male and female leisure travelers were very similar in their rating of each attribute. Although the women rated all attributes higher than did men, significant differences were only found in the sheets changed upon request only attribute, and recycling bin in the hotel lobby. Hypothesis H2<sub>b</sub> is partially supported. Results are presented in Table 17.

ANOVA results, grouped by income and education for leisure travelers, are presented in Tables 18 and 19 respectively. No significant differences were found between any of the individual attributes average preference scores and income or education. These findings do not support H3<sub>b</sub> or H4<sub>b</sub>.

## Involvement Hypothesis

Hypothesis 6 states that the more environmentally friendly activities travelers perform at home, the more preference they will have for green attributes. To test this hypothesis, a correlation analysis was conducted between each variable and the green index (a summation of environmentally friendly activities performed at home) that was created previously. The results produced significant correlations with each variable, for both traveler-types, based on a Bonferroni, non-adjusted p-value < 0.01. Thus, Hypothesis H5<sub>a</sub> and H5<sub>b</sub> are supported. Table 20 highlights the correlations.



Table 16

*Means, Standard, Deviations, and ANOVA results of Individual Attributes for Leisure Travelers Due to Age*

Attribute	Age Group				Total	F-Score	P-Value
	29 or Younger	30 – 39	40 – 49	50 or Older			
Bin in Lobby	5.55 (1.46)	5.53 (1.31)	5.70 (1.50)	5.30 (1.47)	5.51 (1.44)	1.07	.358
Bin in Room	5.16 (1.56)	5.35 (1.37)	5.16 (1.78)	4.87 (1.70)	5.11 (1.62)	1.23	.299
Dispenser	4.70 (1.62)	4.27 (1.83)	4.71 (1.80)	4.32 (1.87)	4.51 (1.79)	0.982	.401
Sensor	5.18 (1.42)	5.09 (1.27)	5.03 (1.80)	4.93 (1.71)	5.04 (1.58)	0.301	.825
Key Card	4.98 (1.65)	4.88 (1.50)	4.92 (1.72)	4.86 (1.63)	5.10 (1.75)	0.075	.973
Bulbs	4.96 (1.61)	5.24 (1.36)	5.23 (1.62)	5.44 (1.36)	5.25 (1.48)	1.22	.301
Towel Re-Use	5.52 (1.55)	5.53 (1.29)	5.18 (1.81)	5.31 (1.64)	5.37 (1.59)	0.781	.505
Sheets on Request	5.27 (1.64)	5.59 (1.37)	5.33 (1.58)	5.44 (1.51)	5.41 (1.52)	0.557	.644
Green Certified	4.71 (1.62)	4.75 (1.32)	4.84 (1.76)	4.73 (1.71)	4.76 (1.61)	0.077	.972

*Note.* Number in parentheses represent the standard deviations for each of the variables measured. Measurement scale ranged from 1 – 7.

Table 17

*Means, Standard Deviations, and T-test Results of Individual Attributes for Leisure Travelers Due to Gender*

Attribute	Gender		t-Score	P-Value
	Male	Female		
Bin in Lobby	5.22 (1.57)	5.72 (1.29)	2.92	0.003*
Bin in Room	4.89 (1.83)	5.29 (1.43)	2.02	0.045
Dispenser	4.35 (1.86)	4.63 (1.74)	1.31	0.192
Sensor	4.76 (1.73)	5.26 (1.43)	2.62	0.010
Key Card	4.73 (1.71)	5.03 (1.54)	1.52	0.129
Bulbs	5.04 (1.58)	5.40 (1.38)	2.04	0.042
Towel Re-Use	5.08 (1.69)	5.59 (1.48)	2.66	0.008
Sheets on Request	5.08 (1.70)	5.67 (1.32)	3.31	0.001*
Green Certified	4.61 (1.70)	4.87 (1.54)	1.33	0.185

*Note.* Bonferroni adjustment was used for all independent samples t-tests. The *p*-values with \* are significant at the adjusted significance level of 0.006 ( $0.05/9 = 0.006$ ). Numbers in parentheses represent the standard deviations for each variable. Measurement scale ranged from 1 – 7.

Table 18

*Means, Standard Deviations, and ANOVA Results of Individual Attributes for Leisure Travelers, Due to Income*

Income Group	Bin in		Shampoo		Occupancy		Key Card		Bulbs		Towel		Sheets on	
	Lobby	Room	Dispenser	Sensor	Re-Use	Request	Certified	Green						
< \$35,000	5.40(1.55)	5.22(1.62)	4.56(1.66)	5.13(1.60)	4.88(1.76)	5.05(1.60)	5.06(1.79)	5.27(1.63)	4.91(1.57)					
\$35,001 - \$55,000	5.51(1.51)	5.07(1.58)	4.48(1.73)	5.15(1.57)	4.93(1.62)	5.42(1.36)	5.57(1.37)	5.58(1.44)	4.85(1.50)					
\$55,001 - \$75,000	5.47(1.42)	5.00(1.78)	4.48(1.89)	5.08(1.63)	4.84(1.69)	5.34(1.49)	5.53(1.69)	5.45(1.62)	4.52(1.83)					
\$75,001 - \$95,000	5.88(1.04)	5.41(1.48)	4.56(1.72)	5.00(1.46)	4.88(1.41)	5.38(1.31)	5.59(1.10)	5.56(1.22)	4.72(1.73)					
> \$95,000	5.46(1.37)	4.92(1.60)	4.23(2.13)	4.62(1.57)	5.03(1.41)	5.10(1.54)	5.21(1.66)	5.23(1.51)	4.69(1.45)					
Overall Average	5.51(1.44)	5.11(1.62)	4.51(1.79)	5.04(1.58)	4.90(1.62)	5.25(1.48)	5.37(1.59)	5.41(1.52)	4.76(1.61)					
F-score	0.650	0.568	0.290	0.883	0.092	0.816	1.489	0.637	0.616					
P-value	0.627	0.686	0.884	0.474	0.985	0.051	0.206	0.636	0.625					

Note. Bonferroni adjusted alpha was used for all ANOVA tests (0.05/9 = 0.006). Numbers in parentheses are the standard

deviations for each of the variables measured. Numbers not in parentheses are the mean scores for each variable.

Table 19

Means, Standard Deviations, and ANOVA Results of Individual Attributes for Leisure Travelers, Due to Education

Education Group	Bin in Lobby	Bin in Room	Shampoo Dispenser	Occupancy Sensor	Key Card	Bulbs	Towel Re-Use	Sheets on Request	Green Certified
High School or less	5.44(1.51)	4.94(1.92)	4.44(1.97)	4.91(1.75)	4.72(1.85)	5.19(1.57)	5.06(1.95)	5.28(1.78)	4.79(1.76)
Some college	5.63(1.43)	5.17(1.53)	4.71(1.71)	5.27(1.48)	5.14(1.52)	5.33(1.42)	5.44(1.45)	5.48(1.37)	4.89(1.47)
Associates Degree	5.35(1.32)	5.03(1.54)	4.22(1.83)	5.14(1.57)	4.92(1.52)	5.05(1.33)	5.27(1.45)	5.05(1.45)	4.51(1.73)
Bachelors Degree	5.41(1.49)	5.19(1.56)	4.38(1.73)	4.98(1.48)	4.74(1.64)	5.14(1.69)	5.53(1.52)	5.47(1.58)	4.66(1.61)
≥ Graduate Degree	5.63(1.41)	5.33(1.44)	4.58(1.79)	4.46(1.64)	4.79(1.41)	5.63(1.14)	5.71(1.40)	5.96(1.12)	4.75(1.65)
Overall Average	5.51(1.44)	5.11(1.62)	4.51(1.79)	5.04(1.58)	4.90(1.62)	5.25(1.48)	5.37(1.59)	5.41(1.52)	4.76(1.61)
F-score	0.424	0.387	0.668	1.519	0.925	0.729	1.163	1.498	0.203
P-value	0.791	0.818	0.615	0.197	0.450	0.573	0.328	0.203	0.776

Note. Bonferroni adjusted alpha was used for all ANOVA tests (0.05/9 = 0.006). Numbers in parentheses are the standard deviations for each of the variables measured. Numbers not in parentheses are the mean scores for each variable.

Table 20

*Correlations Between Individual Attributes and Involvement (Environmentally Friendly Activities Performed at Home)*

	Business Traveler	Leisure Traveler
	Attitude	
Bulbs	.261*	.402*
Shampoo dispenser	.222*	.289*
Bins in Lobby	.237*	.429*
Towel Re-Use Policy	.307*	.376*
Sheets on Request	.297*	.356*
Bins in Room	.206*	.329*
Green Certification	.188*	.309*
Occupancy Sensors	.226*	.332*
Key Cards	.188*	.339*

*Note.* \* Indicates correlation is significant at the 0.01 level

### Environmental Attitude Hypotheses

Hypothesis 6 states that the higher the average environmental attitude score for a traveler, the greater the preference for green attributes. A correlation analysis was conducted to test these hypotheses. The average environmental attitude scores were compared with the mean scores for each attribute. Each attribute was significantly correlated with the attitude scores. Therefore, hypotheses H6<sub>a</sub> and H6<sub>b</sub> are supported. The Results are presented in Table 21.

Table 21

*Correlations Between Individual Attributes and Environmental Attitude*

	Business Traveler	Leisure Traveler
	Attitude	
Bulbs	.431*	.398*
Shampoo dispenser	.309*	.264*
Bins in Lobby	.357*	.392*
Towel Re-Use Policy	.303*	.308*
Sheets on Request	.353*	.332*
Bins in Room	.332*	.346*
Green Certification	.320*	.379*
Occupancy Sensors	.238*	.388*
Key Cards	.328*	.274*

*Note.* \* Indicates correlation is significant at the 0.01 level

### 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). In this dissertation 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, & Keeling, 2002; Orme, 2006; Soutar & 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.

Conjoint analysis is a technique developed to understand how consumers develop preferences for products or services. It is based on the premise that consumers assess the value of the product or service based on the characteristics (or attributes) of the product or service. Essentially, consumers place value on each of the attributes but do not necessarily realize they are doing so. They use the combination of those values to determine their overall preference, or utility, for the product. 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 SPSS software conjoint feature produces part-worth utility scores for each attribute level. The utility scores are similar to coefficients in multiple regression in that each part-worth value represents the "desirability" of that particular attribute level. A positive value in this dissertation represents preference for the attribute level, while a negative value indicates no preference.

Research questions R1 and R2 can be addressed based on these part-worth values. The research questions ask which bundle of environmentally friendly attributes will be most preferred by business and leisure travelers, respectively. Each environmentally friendly attribute has two levels and thus, two resulting part-worth scores. The part-worth scores are presented in Table 22. 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 environmentally friendly hotel room attributes is the same for both travelers. Essentially, the attribute levels with the positive part-worth scores were the same for both types of travelers. Based on the 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. Again, this bundle is determined by the positive part-worth values of each value.



Table 22

*Part-Worth Utility Scores for Each Attribute Level*

Attributes levels	Business	Leisure
	Travelers	Travelers
	Part-Worth	Part-Worth
	Score	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

Conjoint analysis also produces a score for the relative importance 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). The relative importance of each attribute is determined by the range of the attribute’s utility levels (Orme, 2006; Soutar & Ridley, 2008). “The values are computed by taking the utility range for each factor separately and dividing by the sum of the utility ranges for all factors” (SPSS, 2007, p. 33). This is done for each respondent separately and then the results are averaged over all of the respondents. Attributes with the greatest utility ranges are the most influential on overall preference. In essence, the relative importance of each attribute explains the extent to which each attribute makes a difference in the overall preference for the hotel room. The relative attribute importance scores for both business and leisure travelers are presented in Table 23. Green certification was the most influential attribute on overall preference for both leisure and business travelers. Based on these findings, hypotheses H7<sub>a</sub> and H7<sub>b</sub> are supported.

### Reliability

Reliability analysis was conducted on all measurement items – the NEP scale, the attribute importance scale and the scale used to rate each scenario – in order to determine the consistency with which each item in the scale measured the same items. The most common method used to measure the internal consistency of a scale is the Cronbach’s Alpha test (Hair et al., 2006; Norusis, 2005). Cronbach’s Alpha measures the variance between a true score and error. If the variance is large between the two, the items in the scale are measuring the same construct. An acceptable lower limit of Cronbach’s Alpha

Table 23

*Relative Attribute Importance Scores*

Attributes	Business Travelers	Leisure Travelers
	Importance Scores	
Recycling Policy	11.15	10.63
Shampoo Amenities	14.82	14.09
Controlled Lighting	10.75	12.35
Energy efficient light bulbs	14.81	14.73
Towel Policy	15.31	15.78
Linen Policy	15.65	15.60
Green Certification	17.51	16.83
Total	100.00	100.00

in social science research .70 (Hair et al., 2006). Reliability for the NEP scale was analyzed by assessing Cronbach's Alpha coefficient on all 15 statements for both business travelers and leisure travelers. The alpha results were 0.84 for both business and leisure travelers, which points to both the unidimensionality and reliability of the scale. Reliability was also confirmed with Cronbach's Alpha at 0.89 and 0.90 for business and leisure travelers respectively for the attribute importance scale. Reliability for the 12 scenarios was 0.84 for business travelers and 0.86 for leisure travelers. All Cronbach's Alpha scores are high, which indicates that all scales are sufficiently reliable (Hair et al.).

Reliability was also assessed by comparing the individual attribute scores with the importance values of each attribute. First, each individual attribute was ranked in order of preference, based on the mean scores for each attribute. Second, each attribute was ranked based on its importance level produced in the conjoint analysis. With these two sets of rank-scores, a bivariate correlation analysis was conducted between them to see how strongly they were related to each other. The Spearman's rank correlation coefficient provides this measure (McClave, Benson, & Sincich, 2005). It produces values between -1.0 and 1.0. If the rankings were identical for both the individual attributes and the conjoint attributes, the Spearman's rho value would be one. If the rankings were in perfect disagreement, the value would be -1.0. The closer the value is to 0, the less the correlation. The correlation of the rankings for the business travelers was -0.054, and for the leisure travelers was -0.143. These values show that the preference ratings for the individual attributes will not necessarily translate to the same ratings for the attributes when they are presented in a bundle. While this does not negate the results of the study, it does highlight the fact that people, when asked to rate an individual attribute for any type of product or service, may rate it differently than when they see that attribute as a part of the overall product.

### Validity

It is not only important that reliability is assessed in studies but validity must be as well. A valid test is one that measures what it is supposed to measure (Norusis, 2005). There are different measures of validity, one of which is content validity. Content validity, also called face validity, is measured by speaking to experts within the industry

and conducting pilot studies to gain a clear understanding of whether the items in the scale are realistic and measure what they are intended to measure (Hair et al., 2006). Content validity was already assessed and discussed, in relation to the green attributes that were incorporated into the study, in Chapter 3. Experts within the industry agreed that the green attributes utilized in the present study, although not exhaustive, were those that a guest would indeed find in a hotel room today. Content validity for both the NEP scale and the scenario was also ensured because the scales were tested and recommended as such by previous experts.

Another type of validity, internal validity, is concerned with whether the treatment did in fact cause the effect, or, in this dissertation, if the green attributes did in fact cause the changes in preference for each hotel room scenario. In conjoint studies, it is reported in terms of Pearson's correlation. Pearson's R correlation was 0.99 for both leisure and business travelers indicating both a goodness of fit for the model, and strong internal validity.

External validity is a little more difficult to prove in an experimental setting. It is concerned with how generalizable the results are to the larger population under study (Zikmund, 2003). To enhance external validity, the room scenarios that were created were done with the premise, based on the results of content validity, that they were rooms a hotel guest would encounter in an actual hotel. Such an approach, as suggested by Leedy and Ormrod (2001), helps to create a "real-life" setting that participants in the survey could respond to.

Construct validity, as discussed in Chapter 3, is another form of validity that is pertinent to most studies. Construct validity, which comprises convergent, discriminant,

and nomological validity assesses the overall measurement of each construct and whether each item in that construct measures the same thing. In this dissertation, convergent and discriminant validity would be assessed if results of the factor analysis for both the NEP and the attribute scale, had identified distinct factors. The correlations within each factor, whether high or low would have proven or disproven overall construct validity. Since the NEP scale is a unidimensional scale (Dunlap, 2008), however, convergent and discriminant validity cannot be assessed. The same may be said of the scale measuring the environmental attributes. All of the attributes loaded onto one factor so no constructs were developed.

### Summary

This chapter presented the results of this dissertation. The final chapter discusses the results, implications, and limitations. Suggestions are also offered for future research.

## CHAPTER V

### DISCUSSION AND CONCLUSION

#### Introduction

This chapter summarizes and discusses the findings, implications, and limitations, of this dissertation. The first section of the chapter includes the summary of the study, followed by a discussion of the conjoint analysis results, the hypotheses testing results, and a general discussion of the results that were presented in the previous chapter. The next section includes managerial, practical and empirical implications, as well as limitations of the study. Finally, a number of ideas are presented for future research.

#### Summary of the Study

This study identified the bundle of green hotel attributes that both business and leisure travelers most preferred in a green hotel room. It also provided evidence of the type of customers that prefer the attributes by analyzing specific socio- and psycho-characteristics of the customers. It was proposed that there would be significant differences between the various traveler characteristics and preference for the green attributes. The primary research questions were:

1. Which environmentally friendly room attributes, as a bundle, are most preferred by business and leisure travelers?;

2. Is preference for the environmentally friendly attributes in the bundle affected by psycho and socio demographic characteristics of the business and leisure traveler?; and,
3. Is preference for the environmentally friendly attributes in the bundle affected by behavioristic characteristics of the traveler?

The targeted sample for the study was business and leisure travelers who had spent at least one night in a hotel in the past 12 months, and who were willing to stay in an environmentally friendly hotel. The survey was conducted through an online survey company that administered the survey to its panel members. In total, 1323 invitations were sent to members asking them to participate in the survey. Of the 1116 that responded, 305 and 301 usable surveys (a 46% overall response rate) were collected from business and leisure travelers, respectively. After scrutinizing the data for irregularities and discrepancies, 38 cases were removed. The final data set consisted of 284 business travelers and 287 leisure travelers.

Respondents were presented with a series of scenarios that incorporated different combinations of environmentally friendly hotel attributes. They then rated their preference for the scenario on a scale of 1 to 11 (1 was not at all preferred, 11 was extremely preferred). Respondents also rated the importance of each attribute on an individual level using a scale of one to seven (1 was not at all important, 7 was extremely important). Environmental attitude was measured using the New Ecological Paradigm scale developed originally by Dunlap and Van Liere (1978), but re-vamped by Dunlap, Van Liere, Mertig, and Jones (2000). The number of environmentally friendly activities performed at home measured level of involvement. Age, education, income and other



behavioral characteristics were measured using techniques derived from previous studies in this area.

Conjoint analysis was utilized to identify the combination of environmentally friendly attributes that travelers most preferred. In addition, seven hypotheses were tested by utilizing one-way analysis of variance (ANOVA), or independent samples t-test techniques. These procedures tested for differences in the average scores of the individual attributes and the independent variables (travelers socio and psycho demographic characteristics). An overall discussion of the hypotheses-testing results and conjoint analysis results follows next.

#### Hypotheses Discussion

Hypotheses one through four (H1 – H4) were related to demographic characteristics (age, gender, income and education) of the travelers. In terms of gender, it is often said that women are more environmentally conscious than men (Firat, 2009). The results of this study partially support that claim. Both female business and leisure travelers had greater preference for all of the attributes than did the men. However, the differences between their mean scores were only significant across some of the variables. In general, though, female business travelers were more different from their male counterparts, than were the female leisure travelers. Although the results are significant across some variables, the mean scores are still very close to one another. The results suggest that men and women may not be so different as to warrant special attention. As compared to previous studies about green consumers, the results of this study are similar (Hounshell &

Liggett, 1973; Laroche, Bergeron, & Barbaro-Forleo, 2001; Roberts, 1996; Smith, 2001; Stern, Dietz, & Kalof, 1993; Van Liere & Dunlap, 1981).

Age, education, and annual household income gave no significant indication of the type of traveler that most prefers green hotel room attributes. In general, these basic demographic characteristics have not been good predictors of behavior or influence, despite the plethora of research that incorporates them as variables (Firat, 2009). The fact that no relationship was found between age, income, education, and the environmentally friendly attributes in this study is consistent with other research that has also tried to understand the green consumer (e, Taylor, & Ahmed, 1974; Laroche, Bergeron & Barbaro- Forleo, 2001; Rowlands, Scott, & Parker, 2003; Shamdasani & Chon-Lin, 1993). Since basic demographics such as those incorporated into this study were not very successful in distinguishing the participants, it becomes more important to understand their psycho-demographic characteristics.

Hypothesis 5 was related to the environmentally friendly activities the respondents performed at home and whether participation in those activities was correlated with the green attributes in the hotel room. The premise behind this hypothesis was that, if respondents were taking action at home to protect the environment, they would have some level of expertise about the environment, and thus would also take action to protect it while traveling. The hypothesis was supported in that there was a positive correlation between the activities performed at home and each of the individual attributes, which indicates that the more involved the respondents were at home, the greater their preference for the green attributes. The more activities a respondent selected, the more committed to, or involved with, he or she was in protecting the environment. This may be

explained by the respondents' level of enduring involvement. Enduring involvement theory states that consumers have a high level of knowledge, or expertise, about a product or service (Lee & Lou, 1995). This high level of involvement influences their decision making process for both products and services (Celsi & Olson, 1988). In this study, it may be that the respondents were more familiar with (i.e., had a high level of enduring involvement) the green hotel room attributes because they incorporated some of those same attributes into their daily lives. Their high level of involvement translated into preference for the green attributes.

One of the previous studies that surveyed travelers about environmentally friendly hotels (Kasim, 2004) did not directly assess level of involvement, but did ask participants in the study to indicate what environmentally friendly activities they performed at home. In that study, there was no correlation between the activities and the importance placed on green hotel room attributes. The author concluded that an environmental conscious person does not translate to an environmentally conscious traveler, which is the opposite of the findings of this dissertation.

Hypothesis 6, which is related to environmental attitude and whether it was strongly correlated with the attributes, was also supported. The results indicated that the higher the environmental attitude, representing a stronger pro-ecological view, the greater the importance placed on each attribute. This was true of all variables for both types of travelers.

Attitudes are one type of psycho-graphic variable that gets at the heart of describing who a person is, and what they think, as opposed to socio-demographic variables that essentially describe physical characteristics of people. Previous research has had mixed

results with the influence of attitudes, however, on any sort of behavior (Dunlap & Van Liere, 1984; Formica & Uysal, 2002). According to Um & Crompton (1990), they are better predictors of preference; and, they are better predictors than are socio-demographic variables. While this study did not try to predict preference based on attitude, it does give a clearer picture of those travelers, both business and leisure, that place importance on, and have a preference for, environmentally friendly hotel attributes. The results of this study support those of Formica and Uysal (2002) who found environmental attitude a better distinguishing concept than basic demographics.

The last hypothesis, H7 states that:

H7: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room;

H7<sub>a</sub>: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room for business travelers; and,

H7<sub>b</sub>: Green certification will be the most influential attribute on overall preference of an environmentally friendly hotel room for leisure travelers.

Both H7<sub>a</sub> and H7<sub>b</sub> were supported for each traveler-type. Green certification, 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. Green certification is an extrinsic attribute, which is an attribute that is intangible to the consumer (Olson & Jacoby, 1973; Veale & Quester, 2009); oftentimes it is the most influential attribute for consumers (Lee & Lou, 1995). Although previous hospitality studies have 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.

### Conjoint Analysis Discussion

Conjoint analysis was conducted in order to answer research questions 1 and 2, which were:

R1: Which bundle of environmentally friendly hotel attributes will be most preferred by business travelers?; and,

R2: Which bundle of environmentally friendly hotel attributes will be most preferred by leisure travelers?

Based on the results of the conjoint analysis, the bundle was essentially the same for both types of travelers. The environmentally friendly hotel room most preferred by travelers in this study incorporated a refillable shampoo dispenser, energy efficient light bulbs, and towel and linen policies. Respondents were not in favor of having a recycling bin in the hotel room, but instead preferred to have one in the hotel lobby. They did, however, want key cards that controlled power to the room. Finally, they wanted the hotel to be certified as a green hotel.

The fact that some of these attributes are included in the room 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 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.

The fact that the travelers preferred the shampoo dispenser in an environmentally friendly room is interesting. Results of previous studies that have only assessed importance of individual attributes found refillable shampoo dispensers an unpopular green attribute (Kasim, 2004; Watkins, 1994). The dispenser in this study, however, was preferred over the individual bottle of shampoo in the overall room. This outcome may point to the value of a conjoint study. When asked, travelers may indicate a low preference for, or place little importance on the dispenser. However, when given a choice between a dispenser and a bottle, they recognize that the dispenser is friendlier to the environment and thus, choose it over the bottle.

The preference for a recycling bin in the hotel lobby but not in the guest room is also different from previous research (Kasim, 2004; Watkins, 1994). Survey respondents in the previous studies had indicated they would be willing to have a recycling bin in the guest room. Having said that, however, respondents in those studies were also not given the choice between one in the lobby and one in the room. Had they been given a choice, their preferences may have been different.

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. This may indicate a

desire for some sort of regulation in the industry, or something that gives potential hotel guests a clear picture of what constitutes a green hotel.

### General Discussion

Previous literature had claimed 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. They did differ on the order of preference for those attributes, with the exception of green certification, which was the number one preference for both of them. Both groups were also very similar in their average environmental attitude score and in the environmentally friendly activities they perform at home. The primary differences came with gender in that there were more statistically different results for business travelers than for leisure travelers. Business and leisure travelers are often targeted by different types of hotels, which is to be expected, and is understandable. A hotel in downtown Chicago will target business travelers during the week, while a hotel on the beach in Hawaii will target the leisure traveler. 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. This suggests also that any type of hotel, whether leisure or business oriented, can incorporate green policies, or at least the environmentally friendly room identified in this study, and please both types of guests.

Finally, both types of travelers were willing to pay the same amount of money for an environmentally friendly hotel as they would for a traditional hotel. When talking with

industry experts, some claim that their guests wish to pay less for a green hotel room because the guest knows the hotel is saving money by not washing, for example, everyone's sheets everyday. Such guests feel that any savings should be passed on to them in a reduced room price. Conversely, there are those that are willing to pay more for a green hotel room because there is a preconceived notion that green hotels cost more than traditional hotels. This belief may stem from the fact that some products, such as organic foods, are considerably more expensive than their traditional counterpart. As the results of this study indicate, however, both leisure and business travelers just want to pay the same amount. This is important for the hotel industry to understand because it must be careful not to alienate guests by charging too much, as has happened in the organic food industry. Guests may not want to pay more for the green hotel product, especially if they know the hotel is saving some money by incorporating green practices.

### Implications of Findings

The results of this study have practical as well as theoretical and methodological implications. From a methodological standpoint, with the exception of one prominent study (Wind, Green, Shifflet, & Scarbrough, 1989), conjoint analysis has not been used as a research technique in the hotel industry. Conjoint analysis allowed the researcher to gain knowledge about a bundle of green hotel attributes that guests may prefer, instead of just looking at single attributes. Because travelers use more than one attribute when selecting a hotel, a product, or even a tourist destination, conjoint analysis becomes an important marketing research technique. This type of approach enables managers, as



well as local convention and visitors bureaus, to better understand the mix of attributes that make up the most ideal product for travelers.

Also, the results of this study may emphasize the importance of different research techniques when it comes to trying to identify what hotel guests want. Self-explicated models, such as those that ask respondents to rate certain attributes, may produce different results than when those attributes are presented as a package. Several studies in the general marketing research have compared the different techniques, but with mixed results (Leigh, MacKay, & Summers, 1984). Similar studies in the hospitality and tourism industry are relatively unknown.

Another implication is that the results provide empirical evidence that business and leisure travelers do place importance on, and care about, what goes into a green hotel room. These results substantiate the results of previous research that said travelers have become environmentally conscious. Also, although there are a number of green attributes that were not included in this dissertation, the ones that were included provide future researchers with a preliminary list that can be used to validate other research efforts, as well as the results of this study.

There are also several practical implications based on the results gathered in this dissertation. First, the purpose of this study was to identify which environmentally friendly hotel attributes travelers would most prefer in a hotel room, and to profile the customers that prefer them. Understanding guests (who they are and what they want) is essential to the success of a hotel operation. The results from this dissertation help managers to do this in several ways. One is that it is now known what the green consumer wants in a green hotel room. 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.

Second, the results provide a clearer picture of the profile of the traveler that may prefer a green hotel room. Although all demographic characteristics were not correlated with preference for each attribute, those demographics that were, primarily the psychodemographic variables, are useful to managers. Managers of hotels have often been involved in the segmentation of their guests, and offered different products and services to those customers accordingly. Previous studies have shown that travelers are becoming more environmentally conscious, and now there is a glimpse of who, specifically, those travelers are.

Third, this dissertation surveyed two major sectors of the travel industry – business travelers and leisure travelers. While hotel managers consciously decide which to target, there is not much literature about the differences between the two segments, other than the fact that business travelers spend more money, on average, than a leisure traveler does. In this study, the two groups were fairly homogeneous. This tells hotel managers that they may target both groups with similar campaigns, instead of trying to create different campaigns for each type of traveler.

Reliability tests conducted earlier found that travelers placed a different level of importance on each attribute alone than they did for each attribute as part of the conjoint bundle. This is an important distinction for managers. By assessing the attributes individually, as was done in this study, managers can more easily identify the segment of the traveling population that prefers the attributes. Such knowledge is essential in order to develop marketing strategies. If managers wish to market their hotel as an

environmentally friendly hotel, without specifically highlighting any of the green attributes, they can create a marketing campaign geared to all traveler-types based on the bundle of attributes, or the holistic product, that the hotel offers. Segmentation in that instance is not entirely necessary. On the other hand, if a hotel wishes to target a specific market, such as travelers with a high level of involvement with environmentally friendly hotels, they will want to incorporate a strategy that highlights some very specific attributes.

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. 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. If the hospitality industry were to create a label that is straightforward, easy to understand, and truthful, the skepticism can be minimized. There has been much discussion over the past couple of years about creating such a program, but nothing as yet has been done.

In addition, green certification is the one attribute that affects the hotel overall, not just the hotel room. 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. 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 that may be enough of a benefit for managers. 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.

A traveler's level of involvement may provide an insight into travelers, in particular the green traveler, that has been relatively untouched. Again, this applies to the segmentation of travelers by hotel management. Instead focusing on gender or age, managers have the opportunity to tap into other qualities and characteristics that their hotel guests possess. As the hotel market becomes increasingly competitive, management must not only try to differentiate its product, but also try to attract new and different segments of the traveling population. Building a green hotel, or incorporating green practices into existing operations, is one way a hotel can differentiate itself. Understanding involvement or even attitudes enables hoteliers to identify the different segments that may be interested in their green hotel product. Identifying different segments, in turn, enables targeted marketing strategies.

In addition to the practical implications mentioned previously, green certification, indirectly, also has a theoretical implication. Green certification is an extrinsic attribute, such as are price and brand. The role of extrinsic variables versus intrinsic variables on the decision making process for travelers is relatively untouched territory, especially in relation to hotels. The same may be said of involvement. Involvement provides another piece of the puzzle when trying to understand consumer behavior in relation to the hotel decision-making process for travelers. A traveler's level of involvement with the hotel product, and the classification of the hotel attributes (extrinsic vs. intrinsic) are important aspects of decision making that researchers may focus on when trying to explain or understand how travelers select a hotel. On the surface, a traveler may appear to place

importance only on specific hotel attributes, but when analyzing further, there may be an underlying reason for preferring some attributes to others. Levels of involvement, and the type of attribute, are two different aspects that may provide an explanation of a traveler's behavior, preference, or intention in a lodging arena. Both involvement and extrinsic and intrinsic attributes provide more detail to a conceptual model that may explain preference for a particular hotel-type.

### Limitations of the Study

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 attributes chosen for this dissertation 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) that were not incorporated into the study. There are also many environmentally friendly attributes that may pertain 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. In addition, the scenarios may have some attributes that are 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 & Srinivasan, 1978; Hu & Hiemstra, 1996). To avoid information overload, the number of attributes and attribute levels was limited.

Limitations also arise from the fact that the data for this dissertation was collected using an online survey method. As a result, the sample is somewhat biased. Internet users are typically better educated, earn a higher income, and are male. This may not be representative of, nor is it generalizable to, all travelers in the U. S. population, whose responses to this survey may be different. In addition, as mentioned in Chapter 3, not everyone in the population has access to the computer or the Internet, so their responses may not be represented in this dissertation.

Social desirability bias also presents a potential limitation. 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. The propensity to achieve social desirability may be a strong influence on the results of a self-report questionnaire (Ones, Viswesvaran, & Reiss, 1996).

Level of involvement was measured by counting the number of environmentally friendly activities the respondents performed at home. The more activities they performed, the more they were involved with protecting the environment. While there is research stating that the more one partakes in an activity or has strong feelings towards an issue, the more he or she is likely to carry that activity into other parts of their lives, there is no previous research that specifically uses the activities presented in this dissertation as a measure of that involvement. Some researchers have used recycling at home as a predictor of willingness to pay for organic products (Tsen, Phang, Hasan, & Buncha, 2006), but no other activities were used.

Finally, 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 valid opinions about the type of attributes that may be incorporated into that hotel.

### Implications for Future Research

There are aspects of this dissertation that are somewhat exploratory in nature because there is no previous hospitality research that is very similar. As a result, there are many implications for future research. One is to gain a better understanding of the supply side of green hotel attributes. This study analyzes the demand side, the customer's thoughts and behaviors, but does not take into account what hotel management thinks about environmentally friendly hotels, and to what extent they may be incorporating environmental policies into their company culture. As in this dissertation, an attempt can be made to understand the psycho-demographic characteristics of managers and owners that feature such policies. The same type of research can also be conducted with the employees of a lodging facility.

This type of study can also be conducted for specific hotel categories. Results may differ for customers of luxury resorts and those of budget lodging facilities. In addition, the same type of study may be conducted for food and beverage establishments, both within hotels and stand-alone facilities that are serving or thinking about serving organic food and beverages. The meetings and event industry has embraced green practices, but there is no academic research assessing either meetings planners or meeting attendees and

whether a green meeting influences their site-selection decision or their decision to attend the meeting.

This dissertation only analyzed in-room environmentally friendly attributes. As mentioned in the limitations of the study, there are 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, may influence preference for a hotel. Again, the same may be done for food and beverage establishments in those hotels, or meeting venues within larger lodging facilities.

Price and willingness to pay for an environmentally friendly hotel room were not analyzed in this dissertation because there was no clear formula for computing different prices level 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 needs to be conducted to understand how price may influence a traveler's preference for an environmentally friendly hotel.

Green certification was the most influential attribute in overall preference for the environmentally friendly hotel room in this dissertation. 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.

The consumer decision-making process is not only influenced by attitude, but may also be influenced by values and other beliefs. Future research that seeks understanding



of the green hotel consumer should also assess personal values and how they, coupled with attitude, and other green attributes may influence green hotel preference. The same process may be used on the supply side of green hotels by gaining a better understanding of the hoteliers who incorporate green practices.

While some significant differences did exist between men and women, because the means were not very large or very far apart, the practical implications of the significant differences were not meaningful. However, having said that, there is much research that has found significant differences between men and women in terms of environmentally conscious behavior (Firat, 2009), and the women in this dissertation did rate all attributes higher than did the men. This would stimulate future research to try to foster a better understanding of why, oftentimes, women seem more concerned about the environment than men. A deeper assessment of the role of environmental attitude, personal values of men and women, or other environmentally conscious behavior may address this issue.

Future research may also look at the brand image of a hotel or even a city, to see if either it may influence hotel guests' perceptions of a property that is or claims to be green. Las Vegas, which is an established brand, would provide a perfect backdrop for such a study. Because Las Vegas is perceived as a city of fun, excess, and sin, guests may not take seriously the fact that a resort may want to protect the environment. Certain hotel brands have established certain identities and have attracted customers based on those brands/identities. If the hotel brand decided to build a green hotel, or include green practices into current operations, this may affect their brand image for current customers. It may also clash with what current guests perceive the brand to be, which can lead to alienation. If hoteliers in Las Vegas, for example, wanted to advertise

their green property, or build a green hotel from the ground up, they would have to understand how the customer is going to perceive a hotel in the Las Vegas environment.

Finally, the process in this study may be applied to other types of businesses within a large resort or casino. Many resorts, for example, may have one or more food and beverage outlets that may or may not be operated by the hotel itself. Most often, someone other than the hotel operates them. The same may be said of retail outlets. The question then, in relation to environmental behavior or policy, would be how those food and beverage, or retail outlets fit in with the hotel that already incorporates an environmental policy. Perhaps the customer may not care, or perhaps they believe those outlets should adhere to the same philosophy.

### Conclusion

The primary purpose of this study was to identify the type of green hotel room that guests may 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, or at least hotels that are interested in making their hotel more environmentally friendly, by providing the green attributes that may be most desirable to guests. The technique used to identify the combination of environmentally friendly attributes that travelers most prefer, conjoint

analysis, also adds to the methodological literature in hospitality and tourism. Conjoint analysis provides a clearer picture than does typical self-explicated techniques, of attribute importance, yet it is rarely used in hospitality research.

Trying to understand the guest that prefers an environmentally friendly room was the next purpose of the study. Analyzing various socio- and psycho-demographic variables, as well as behavior and level of guest involvement, and their relationships with each environmentally friendly attribute, provided that understanding. This finding has practical implications for management in terms of advertising and marketing strategies targeted to specific populations using either individual green attributes, or the product as a whole.

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. The same may be said of involvement behavior and environmental attitude. In particular, they provide different factors that may be incorporated to consumer behavior models that are applied to the hospitality industry.

## APPENDIX

### SURVEY

#### Intro

Hello and thank you for coming to this site to participate in the survey. My name is Michelle Millar and I am a doctoral student working on my dissertation in Hospitality Management at the University of Nevada, Las Vegas.

You are invited to participate in a research study. The purpose of this study is to understand the combination of hotel room attributes that business and leisure travelers prefer to have in their hotel room. The results are expected to highlight which hotel attributes a guest would like hotel operators to incorporate into their hotel operations. You are being asked to participate in the study because you have stayed in a hotel within the past year. There may be no direct benefits to you as a participant in this study; however, we hope to learn what attributes of a hotel are of importance to you as a hotel guest. If you volunteer to participate in this study, you will be asked to complete the attached survey, which should take no longer than 20 minutes of your time. There are risks involved in all research studies. This study, however, presents no more than minimal harm. Should you become uncomfortable while answering some questions, you may choose to discontinue the survey at that time.

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study. All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be destroyed.

If you have any questions or concerns about the study, you may contact Seyhmus Baloglu at 702-895-3932 or Michelle Millar at 702-895-4458. For questions regarding the rights of research subjects, any Complaints or comments regarding the manner in which the study is being conducted, you may contact the UNLV Office for the Protection of Research Subjects at 702-895-2794.

Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you **STRONGLY DISAGREE**, **DISAGREE**, **Neither AGREE nor DISAGREE**, **AGREE**, or **STRONGLY AGREE** with the statement.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
We are approaching the limit of the number of people the earth can support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humans have the right to modify the natural environment to suit their needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When humans interfere with nature it often produces disastrous consequences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human ingenuity will insure that we do NOT make the earth unlivable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humans are severely abusing the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The earth has plenty of natural resources if we just learn how to develop them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plants and animals have as much right as humans to exist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you **STRONGLY DISAGREE**, **DISAGREE**, **Neither AGREE nor DISAGREE**, **AGREE**, or **STRONGLY AGREE** with the statement.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
The balance of nature is strong enough to cope with the impacts of modern industrial nations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Despite our special abilities humans are still subject to the laws of nature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The so-called "ecological crisis" facing humankind has been greatly exaggerated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The earth is like a spaceship with very limited room and resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humans were meant to rule over the rest of nature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The balance of nature is very delicate and easily upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humans will eventually learn enough about how nature works to be able to control it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If things continue on their present course, we will soon experience a major ecological catastrophe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**What is your gender?**

- Male
- Female

**What is your age range?**

- < 20
- 20 - 25
- 26 - 29
- 30 - 35
- 36 - 39
- 40 - 45
- 46 - 49
- 50 - 55
- > 55

**What is your annual household income?**

- |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| < \$35,000            | \$35,001 - \$55,000   | \$55,001 - \$75,000   | \$75,001 - \$95,000   | > \$95,000            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**What is your education level?**

- |                       |                       |                       |                       |                           |
|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|
| High School or less   | Some college          | Associates Degree     | Bachelors Degree      | Graduate degree or higher |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |

**What is your marital status?**

- |                       |                       |                              |                       |
|-----------------------|-----------------------|------------------------------|-----------------------|
| Married               | Single                | Widowed, divorced, separated | Other                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> |

**Screeners**

**Would you consider staying in an environmentally friendly lodging (green hotel) property?**

**Consider such a hotel as one that has put policies in place that help it to reduce the harmful impact it might have on the environment.**

- Yes
- No

**Over the past 12 months, have you taken at least one business trip that involved staying overnight at a lodging facility (hotel, motel, resort)?**

- Yes
- No

**Over the past 12 months, have you taken at least one leisure trip that involved staying overnight at a lodging facility (hotel, motel, resort)?**

- Yes
- No

Below are environmentally friendly features that you might find in a hotel or hotel room. These are features that help a hotel minimize the negative impact the it might have on the environment. Please rate how important it is to you to have these features in a hotel room. Level of importance is rated from 1 = not at all important to 7 = extremely important. Please select only one option for each feature.

	1 Not at all important	2	3	4	5	6	7 Extremely Important
Use of energy efficient light bulbs in the guest rooms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Refillable shampoo dispensers instead of individual bottles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycling bins in the hotel lobby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Towel re-use program (i.e. place towel on hook if you wish to re-use it)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sheets changed upon request only, for stays up to 3 nights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycling bins in the guest room	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hotel is certified as a green hotel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



The following pages contain combinations of environmentally friendly attributes that you might find in a hotel room.

Some of the attributes will change in each room.

Assume that all unmentioned attributes (i.e. cleanliness, ideal location, etc.) are the same for each of the rooms.

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

**Room 1:**

Recycling bins in the hotel lobby

Refillable shampoo dispenser

Key cards that turn power to the room on and off

No energy efficient light bulbs in the guestroom

Fresh towels daily

Sheets changed upon request only

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 2:**

Recycling bins in the hotel room

Refillable shampoo dispenser

Key cards that turn power to the room on and off

No energy efficient light bulbs in the guestroom

Towel reuse policy

Sheets changed daily

Hotel is NOT certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 3:**

Recycling bins in the hotel lobby

Refillable shampoo dispenser

Occupancy sensors to control lighting in the room

Energy efficient light bulbs in the guest room

Towel re-use policy

Sheets changed daily

Hotel is **NOT** certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 4:**

Recycling bins in the hotel lobby

Individual bottle of shampoo

Key cards that turn power to the room on and off

Energy efficient light bulbs in the guest room

Towel re-use policy

Sheets changed upon request

Hotel is **NOT** certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 5:**

Recycling bins in the guest room

Individual bottle of shampoo

Key cards that turn power to the room on and off

Energy efficient light bulbs in the guest room

Fresh towels daily

Sheets changed upon request only

Hotel is NOT certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 6:**

Recycling bins in the hotel lobby

Refillable shampoo dispenser

Occupancy sensors to control lighting in the guest room

No energy efficient light bulbs in the guestroom

Fresh towels everyday

Sheets changed upon request only

Hotel is NOT certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 7:**

Recycling bins in the hotel lobby

Individual bottle of shampoo

Key cards that turn power to the room on and off

No energy efficient light bulbs in the guest room

Towel reuse policy

Sheets changed daily

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 8:**

Recycling bins in the guest room

Refillable shampoo dispenser

Key cards that turn power to the room on and off

Energy efficient light bulbs in the guestroom

Fresh towels daily

Sheets changed daily

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 9:**

Recycling bins in the hotel lobby

Individual bottle of shampoo

Occupancy sensors to control lighting in the room

Energy efficient light bulbs in the guestroom

Fresh towels daily

Sheets changed daily

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
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Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 10:**

Recycling bins in the hotel room

Individual bottle of shampoo

Occupancy sensors to control lighting in the room

No energy efficient light bulbs in the guestroom

Fresh towels daily

Sheets changed daily

Hotel is NOT certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
------------------------	---	---	---	---	---	---	---	---	---	------------------------

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 11:**

Recycling bins in the hotel room

Individual bottle of shampoo

Occupancy sensors to control lighting in the room

No energy efficient light bulbs in the guestroom

Towel re-use policy

Sheets changed upon request

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
------------------------	---	---	---	---	---	---	---	---	---	------------------------

Please rate your preference, based on the group of attributes, for the room on a scale of 0 (not at all preferred) to 10 (extremely preferred).

Attributes in red are different from the previous room.

**ROOM 12:**

Recycling bins in the hotel room

Refillable shampoo dispenser

Occupancy sensors to control lighting in the room

Energy efficient light bulbs in the guestroom

Towel re-use policy

Sheets changed upon request

Hotel is certified as a green hotel

0 Not at all Preferred	1	2	3	4	5	6	7	8	9	10 Extremely Preferred
------------------------	---	---	---	---	---	---	---	---	---	------------------------

Over the past 12 months please estimate how many nights you spent in a lodging facility while on a leisure trip?

1 - 5

6 - 10

11 - 15

16 - 19

> 19

Thinking about the last time you stayed in a lodging property for leisure travel, what type of lodging property was it (please select one)?

Economy

Mid-priced

Full service

Luxury/Resort

Other

I am willing to pay \_\_\_\_\_ than I otherwise would to stay at a green lodging property (please fill in the blank with one option below).

Less

Same

More

How much less?

5%

10%

15%

How much more?

5%

10%

15%

Which environmentally friendly activities do you currently perform at home? Please check all that apply.

Recycle cans & bottles

Buy organic groceries

Recycle paper & cardboard

Re-use plastic bags

Use energy efficient light bulbs

Other? Please specify

Use low flow water fixtures

None

Use cloth grocery bags

If you had the option of getting a lottery ticket for either:

**A free night in an environmentally friendly hotel, or**

**A free meal in an upscale restaurant, plus a free night in a non-environmentally friendly hotel.**

which one would you choose?

Free night in an environmentally friendly hotel

Meal plus a free night in a non-environmentally friendly hotel

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