Consumer Choice of Hotel Experiences: The Effects of Cognitive, Affective, and Sensory Attributes

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Dissertation submitted to the faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
In
Hospitality and Tourism Management

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July 6, 2011

Blacksburg, Virginia

Keywords: Consumer Choice, Cognitive Attributes, Affective Attributes, Sensory Attributes, and Bayesian D-optimal Design

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ABSTRACT

Understanding the choice behavior of customers is crucial for effective service management and marketing in the hospitality industry. The first purpose of this dissertation is to examine the differential effects that cognitive, affective, and sensory attributes have on consumer hotel choice. The second purpose is to examine the moderating effects of consumer choice context on the relationship between the cognitive, affective, and sensory attributes and hotel choice.

To achieve these two purposes, this dissertation includes the design of a choice experiment to examine how cognitive, affective, and sensory attributes predict consumer hotel choice using multinomial logit (MNL) and random parameter (or mixed) logit (RPL) models. For choice experiments, the main objectives are to determine the choice attributes and attribute levels to be used for the choice modeling and to create an optimal choice design. I used a Bayesian D-optimal design for the choice experiment, which I assess from the DOE (design of experiment) procedure outlined in JMP 8.0. The primary analysis associated with discrete choice analysis is the log-likelihood ratio (LR) test and the estimation of

the parameters (known as part-worth utilities), using LIMDEP 9.0. The results showed that the addition of affective and sensory attributes to the choice model better explained hotel choice compared to the model with only cognitive attributes.

The second purpose is to examine the moderating effects of choice context on the relationship between cognitive, affective, and sensory attributes and hotel choice. Using a stated choice model, respondents were randomly divided into two different groups and asked to evaluate their preference for two differently manipulated choice sets. For this purpose, it is necessary to include interaction effects in the choice model. This study identified the differences among choice criteria based on two different contexts. Among eight interaction effects, four interaction effects with the contexts -- price, comfortable, room quality, and atmosphere -- were statistically significant on hotel choice. The findings provide hotel managers with important insights and implications in terms of target segmentation, product development, and marketing communication strategy.

DEDICATION

I dedicate this dissertation to my husband, Byung-Jin (Robert) Park who always gave me encouragement, love, and advice as my best academic partner, and to my daughters, Junghyun (Jenny) and Minjoo, who taught me the value of family as the source of happiness in my life. I would also like to dedicate this dissertation to my mother and father for their support, sacrifices, and love.

ACKNOWLEDGEMENTS

This dissertation could not have completed without the help, support, sacrifice, and love of several people whose contributions I want to acknowledge. This academic journey was very challenging because my husband and I were always at the same stage in our Ph. D. programs and we had to take care of two daughters. Without the strong support and sacrifice of my mother and father, I would not have completed the Ph. D. program at Virginia Tech.

First, I would like to thank Dr. Richard Perdue, my committee chair, for his invaluable guidance, support, and patience since I started the Ph. D. program in 2006. I have learned much from Dr. Perdue who gave me constant advice throughout the research and dissertation process. He helped me do independent research and taught me how to work with colleagues. These will be invaluable lessons and assets for my life.

I would like to thank my wonderful committee members, Dr. Ken McCleary, Dr. Muzaffer Uysal, and Dr. Joseph Sirgy, for their interest, support, and contributions to my dissertation. Their comments and suggestions improved my dissertation and made my work more valuable. I thank Dr. McCleary for his valuable suggestions and comments. I also thank Dr. Uysal for his kind advice during my Ph.D. program and his comments on this work. I appreciate Dr. Sirgy for his sincere feedback and comments on my dissertation and kindness. As a very sharp thinker and theoretical expert, he gave me advice throughout the dissertation process.

I would also like to thank Dr. Vincent Magnini who always gave me advice and insights whenever I asked him. I was lucky to do research with him. I am grateful to Dr. Manisha Singal who always treated me like her younger sister and provided direction and comments for my dissertation. Also, I would like to thank Professor Howard Feiertag who provided comments and

inspiration for my dissertation and in particular, introduced me to hotel managers who helped with this work.

I also appreciate Dr. John Morgan and Dr. Inyoung Kim in the Department of Statistics. Dr. Morgan helped me understand choice design and suggested I use JMP for the choice experiment design. As a design expert, he provided the foundation for the choice experiment design. Dr. Kim helped me understand and solve statistical issues for my dissertation at the last minute.

Although I cannot mention everyone one by one, I owe special thanks to my fellow graduate students in the Department of Hospitality and Tourism Management at Virginia Tech who participated in several surveys and in-depth interviews and provided valuable advice and comments. I would like to thank Ms. Dietrich Melissa and the staff in the HTM office for their support during my study.

Finally, I really appreciate my best friend, Hee-sook Lee, who always gave me courage, comfort, and love during this stressful academic journey in the US. Whenever I needed her help and comfort, she was always with me. Although I cannot mention everyone who has helped me accomplish this dissertation, I will remember their help and contributions forever. I am grateful to you all.

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CHAPTER I

INTRODUCTION

1.1 Statement of Problem

The hospitality and travel industry has undergone rapid change due to greater competition, more experienced customers, the entry of large corporations, and a more complex market (Morrison, 2002). In such a competitive environment, hotel marketing has become more important than ever before (Kotler, Bowen, and Makens, 2010). Hospitality companies achieve competitive advantage over their competitors by designing attractive products and effectively marketing them to target consumers. Thus, hotel corporations have introduced a variety of brands that provide different combinations of product characteristics. The early research on developing these brands focused on the cognitive attributes of hotels. For example, Marriott developed a successful new hotel chain, Courtyard by Marriott, using conjoint analysis of seven physical layout and service attributes, such as external factors, rooms, food-related services, lounge facilities, services, facilities for leisure-time activities, and security (Wind, Green, Shefflet, and Scarbrough, 1989).

Recently, however, the importance of affective attributes on the hotel experience has been increasingly recognized (e.g., Barsky and Nash, 2002; Gilmore and Pine, 2002; Ladhari, 2009). It has become very difficult to differentiate between hospitality products and services on the basis of their tangible attributes. Verma and Plascha (2003) argue that as the hospitality market has overflowed with similar cognitive attributes and easily substitutable services, it has become difficult to differentiate a hotel from its competitors based only on functional value. As more and more service brands and products become commoditized, competitive differentiation must be achieved through the creation and management of the customer's emotional experience

(Berry, Carbone, and Haeckel, 2002; Morrison and Crane, 2007). Bitner, Ostrom, and Morgan (2008) argue that instead of simply offering physically superior core products (e.g., physical attributes), companies should focus on customer experience management so that they create long-term value by establishing emotional bonds with their customers. Well-designed services that create pleasant emotional experiences can provide a firm with a key point of differentiation from its competitors. Kraus (2000) argues that differentiation succeeds when it makes a brand's distinguishing characteristics valuable and important to the buyer. As hospitality and tourism products are in essence experiential (Williams, 2006), hotel corporations need to identify and develop a strategic position by focusing on creating experiences that differentiate their brands from competitors (Dube, Bel, and Sears, 2003). Gilmore and Pine (2002, p.89) argue that "innovative experience design will become a critical component of any successful hotel company's core capability" by creating new value through memorable experiences. Shaw and Ivens (2002) argue that customer experience as a source of long-term competitive advantage is created by consistently exceeding not only the customer's cognitive, but also emotional expectations. In sum, a hotel's strategy must make the joint promise of a distinctive experience and emotional value combined with physical products and services (Dube and Renaghan, 1999). To date, however, little research has combined both a cognitive and an experiential perspective to understand customer hotel choice behavior.

To fully understand customer choice in the hotel context, it is important that consumer choice behavior be examined through a complete understanding of the interplay between a consumer's cognitive attributes and affective preferences. Thus, using discrete choice modeling, this dissertation assesses the relative impact of cognitive, affective, and sensory attributes on hotel choice. The following sections of this chapter provide further background on the

recognition of the experience economy, with a focus on the effects of an experiential approach on decision making and choice. Next, an overview of consumer choice, including hotel choice research, is provided. The chapter concludes by stating the research objectives and questions, outlining the proposal of a customer choice model, and reviewing the contributions of this research.

1.2 Recognition of the Experience Economy

Consumer research has increasingly examined experiential consumption, which is a consumer's subjective and emotional reaction to product consumption. Consumption experience refers to "the total outcome to the customer from the combination of environment, goods, and services purchase" (Lewis & Chambers, 2000, p. 46). An experiential perspective may provide important information for product development and marketing, and provide a useful analytical perspective for successful service encounter management. "The experiential view," which focuses on the symbolic, hedonic, and aesthetic nature of consumption, was first suggested by Holbrook and Hirschman (1982). Hirschman and Holbrook (1982) argued the necessity of a hedonic perspective because the traditional framework that focuses only on cognitive and utilitarian performance cannot explain products whose selection and use are based upon satisfying emotional wants and aesthetic needs. Staging experiences greatly increase the value rendered to customers. With this perspective, Pine and Gilmore (1998) introduced the concept of an experience economy and argued that to create greater economic value, companies should create memorable experiences, not just deliver services. Similar arguments have been proposed by several authors, including Schmitt (1999), Shaw and Ivens (2002), Smith and Wheeler (2002), and Holbrook (2006).

According to Meyer and Schwager (2007, p. 118), customer experience is defined as "the internal and subjective response customers have to any direct or indirect contact with a company." Experiences, which are used as information (Pham, 2004), arise directly and indirectly from a variety of settings. Most experiences occur directly when consumers shop, buy, and consume products. "Experiences can occur indirectly – for example, when consumers are exposed to advertising and marketing communications, including websites" and "brand-related stimuli such as brand-identifying colors, shapes, typefaces, background design elements, slogans, mascots, and brand characters" (Brakus, Schmitt, and Zarantonello, 2009, p.53). Thus, customer experience is "a blend of an organization's physical performance, the senses stimulated, and emotions evoked" (Shaw, 2005, p. 13; Shaw and Ivens, 2002). Similarly, Brakus et al. (2009) found that internal customer responses (experiences) consist of sensory, affective, and intellectual dimensions. In particular, emotions and senses play an important role in the customer experience (Shaw, 2005). Thus, scholars are paying increasing attention to the role of affect (emotions) on the consumption experience (e.g., Derbaix and Pham, 1991; Holbrook, 1986).

Since the mid 1970s, there has been increasing awareness that cognition and affect may occur simultaneously or in parallel (Peterson, Hoyer, and Wilson, 1986) and that cognitive and affective processing should be studied separately to better understand consumer decision making (Bagozzi, Gopinath, and Nyer, 1999; Erevelles, 1998). Thus, a growing number of consumer behavior studies have examined the differential effects of cognitive and affective attributes on choice, decision making or judgment, and behavioral intentions (e.g., Brakus, Schmitt, and Zhang, 2008; Darke, Chattopadhyay, and Ashworth, 2006; Dhar and Wertenbroch, 2000; Neelamiegham and Jain, 1999; Shiv and Fedorikhin, 1999).

Similarly, in hospitality research, scholars are increasingly recognizing the importance of emotions and the experiential approach to decision making and choice (McIntosh and Siggs, 2005; Oh, Fiore, and Jeoung, 2007). Most products offered by the hospitality and tourism industry are essentially experiences (Tsaur, Chiu, and Wang, 2006; Williams, 2006). Presuming customers evaluate hospitality experiences primarily in emotional terms, hospitality managers need to know the emotional dimensions of the customer experience and the ways they can meet emotional needs (Lashley, 2008). Thus, there has been a growing recognition of the affective attributes of hotel experiences (e.g., Barsky and Nash, 2002; Ladhari, 2009; Martin, O'Neill, Hubbard, and Palmer, 2008; Wong, 2004). Barsky and Nash (2002) found that customer purchases are strongly influenced by the emotions they experience in a hotel.

Other recent research suggests considering both the cognitive and affective attributes of products. Erevelles (1998) argued that products have two basic dimensions: a cognitive dimension that encompasses the functional attributes and performance of the product and an affective dimension that encompasses the hedonic, emotional, and aesthetic attributes of a product. Hospitality and tourism products, such as vacation resorts, hotels, and theme parks, are high in both affective and cognitive attributes (Gursoy, Spangenberg, and Rutherford, 2006; Voss, Spangenberg, and Grohman, 2003). Based on this literature, this dissertation suggests that customers' hotel choice behaviors are influenced not only by cognitive attributes (e.g., brand name, price), but also by affective attributes (e.g., excitement, comfort, safety). Thus, this dissertation examines the differential effects of cognitive, affective, and sensory attributes on customer choice behavior in the hotel context.

1.3 Understanding Hotel Choice

Understanding consumer choice is critical to marketing success (Bettman, Luce, Payne, 2008). Extensive research on consumer choice exists both in the general consumer behavior and in the specific hospitality literatures. This section briefly reviews this literature, focusing first on an overview of customer choice studies in the consumer behavior literature and second on an overview of hotel choice studies.

Choice behavior studies have evolved from those built on a rational model of choice behavior (classical decision theory) to the use of models based on bounded rationality (Holbrook and Hirschman, 1982). The rational choice view postulated a rational "economic man" who has a well-organized system of preference and computation capability and achieves the highest preference point (Simon, 1955). The latter approach has evolved into what is called the information processing model (Bettman, 1979). The information processing perspective views "consumers as rationally bounded, yet emotionally dispassionate, decision makers who logically evaluate alternatives in terms of trade-offs among product attributes" (Khan, Dhar and Wertenbroach, 2005, p.145). As a result, the study of consumer choice has traditionally taken a multi-attribute utility perspective. A choice alternative's "overall evaluation is assumed to be the weighted average of the subjective values or utilities associated with the individual attributes" (Ajzen, 2008, p. 527). Thus, consumers choose the product with the highest perceived subjective utility among the choice alternatives. Anderson's (1971, 1981) information integration theory describes the process by which stimuli are combined to form beliefs or attitudes in order to understand consumer decision making. That is, "information integration theory offers a specific mechanism to describe how individuals integrate separate pieces of available information into an overall preference (an evaluation)" in terms of a scale of value and weight (importance)

(Degeratu, Rangaswamy, and Wu, 2000, p. 57). Meanwhile, the information processing model and the multi-attribute model of attitude formation (Fishbein and Ajzen, 1975) assume affect as a result of information integration, not as a cause (Peterson et al., 1986). The traditional information processing model neglects the affective dimensions of choice (Holbrook and Hirschman, 1982). In joining these different perspectives, Bettman, Luce, and Payne's (1998) constructive choice view bridges the information processing model of Bettman (1979) and an experiential view in the sense that customer choice is highly contingent on customer decision goals and is context dependent (Kwortnik, 2003).

As one of the dual processing theories, Epstein and Pacini (1999) and Epstein's (2003) cognitive-experiential self-theory (CEST) provides the theoretical background for the integration of cognitive and experiential approaches. Epstein (2003) argues that consumers process information rationally and experientially by using two conceptual systems: "(a) a rational system which is cognitive in nature and is associated with a more refined and deliberative processing; and (b) an experiential system, which is affective in nature and is associated with crude and rapid processing" (Shiv and Fedorikhan, 1999, p. 28). Especially, as affect can greatly simplify information processing in decision making, it plays a functional role in judgment (Pham, 1998). Affective choice has the potential to create long-lasting purchase satisfaction (Darke et al., 2006), suggesting that information processing and judgment can be driven by multiple processing goals, including hedonic goals. Also, affective or sensory attributes may make up for the functional inferiority of products in a situation in which both cognitive and affective attributes are present (Brakus et al., 2008), or when alternatives are not differentiated (Havlena and Holbrook, 1986). Bateson and Hoffman (1999) claim that affect plays an important role in how customers will ultimately assess the service encounter and, subsequently, the firm's overall quality and value.

Therefore, to understand customers' product choices, it is necessary to integrate the experiential view into existing cognitive choice models (Peterson et al., 1986).

To understand customer hotel choice behavior, it is necessary to know that hotel products have several characteristics. According to Hanai, Oguchi, Ando, and Yamaguchi (2008), hotel products are difficult to compare because customers cannot select a particular hotel after having tried out all other options in the area. As the products are relatively expensive, occasionally and infrequently purchased, and mainly consist of services, hotel choice is included among high-risk purchases in that the fundamental properties of services (intangibility, heterogeneity, perishability, and inseparability) increase the degree of perceived risk associated with the purchase (Mitchell and Greatorex, 1993). Based on the existing literature, hotel choice in this study is viewed as the result of the process by which a customer selects, from a set of alternatives, the hotel that is perceived as having the greatest utility and pleasurable experience to satisfy his/her particular needs or wants.

As with general consumer choice research, hotel choice research has transitioned from emphasizing the cognitive attributes of hotels to a growing recognition of the affective and the experiential approaches (e.g., Barsky and Nash, 2002; Knutson, Back, Kim, and Cha, 2009; Oh et al., 2007). Beginning with Lewis (1984a, 1984b), a number of hotel choice studies (e.g., Knutson, 1988; Callan and Bowman, 2000; Dolnicar, 2002; McCleary, Weaver, and Lan, 1994; Siguaw, Simpson, and Kasikci, 2006; Yavas and Babakus, 2005) have focused on the attributes used to choose a hotel in terms of cognitive and tangible attributes and/or have examined the differences between hotel choice attributes, depending on the type of traveler (leisure vs. business) (e.g., Yavas and Babakus, 2005), gender (e.g., McCleary et al., 1994), hotel type (Verma, Plaschka, and Dev, 2005), and purchase stage (initial vs. repeat purchase) (e.g., Lewis,

1984a; Dube and Renaghan, 1999, 2000). One key finding of this research is that leisure travelers emphasize a comfortable stay and safety, whereas business travelers focus on convenience and productivity (Dube and Renaghan, 1999). In addition, several studies have examined the role of consumption emotions on behavioral intentions or satisfaction after a consumption experience (e.g. Ladhari, 2009; Martin et al., 2008; Wong, 2004). More recently, research has examined how a consumer's choice of hospitality products is affected by both cognitive and emotional considerations (Kwortnik, 2003). While hospitality guests are looking for value and the right features, they also expect something that engages their senses and feelings and/or something that provides fun, excitement, and enjoyment.

The existing hospitality choice research is largely based on revealed choice studies and/or reviews of consumer revisit intentions after a hotel stay or experience. Most hotel choice studies that have focused on the important (or determinant) attributes of hotel selection, revisit intention, or satisfaction are limited in their identification of the real trade-offs among different attributes in a hotel choice context. Because many product and service bundles are considered simultaneously, discrete choice analysis (DCA) can be an effective method to assess the trade-offs that consumers make and thus determine real preferences (Crouch and Louviere, 2001). For example, Verma and colleagues have used DCA to examine the relative importance of attributes on choice (e.g., hotel and pizza) and to identify choice structure (e.g., Verma et al., 1999, 2002, Victorino et al., 2005). In sum, DCA based on stated choice data can identify the actual decision making process in that the most preferred profiles are usually selected after consumers make trade-offs among different attributes (Chau, Tse, and Chung, 2010) and thus capture the relative importance of various choice attributes in a dynamic and complex choice context.

To fully understand customer choice in the hotel context, it is important that consumer choice behavior be examined through a complete understanding of the interplay between a consumer's cognitive attributes and affective preferences. However, with the exception of Ladhari's (2009) research, previous hotel choice studies have not integrated both cognitive and affective attributes to examine hotel choice behavior. To address this research gap, this study aims to use stated choice modeling to identify how affective attributes interact with cognitive attributes to influence hotel choice. Based on Bettman et al.'s (1998) constructive choice process and an experiential approach, this dissertation suggests that when making a hotel choice, consumers may have relative preferences for affective attributes rather than cognitive attributes, depending on their choice context (Pham, 1998).

1.4 Purpose of This Research

1.4.1 Research Objectives

This study examines the differential effects that cognitive, affective, and sensory attributes have on consumer hotel choice. Through its research model, this dissertation examines the value of incorporating an experiential approach into hotel choice modeling. Another purpose is to examine how choice context influences the relative importance of affective and sensory attributes as compared to cognitive attributes in hotel choice. Specifically, differences in the choice attributes between two distinct contexts are identified. The hotel choice context consists of leisure and business travel. Based on the main purpose of travel, leisure travelers are influenced by affective and/or sensory attributes, while also being price sensitive. Business travelers are influenced by cognitive attributes, while being sensitive to room quality for work efficiency.

1.4.2 Research Questions

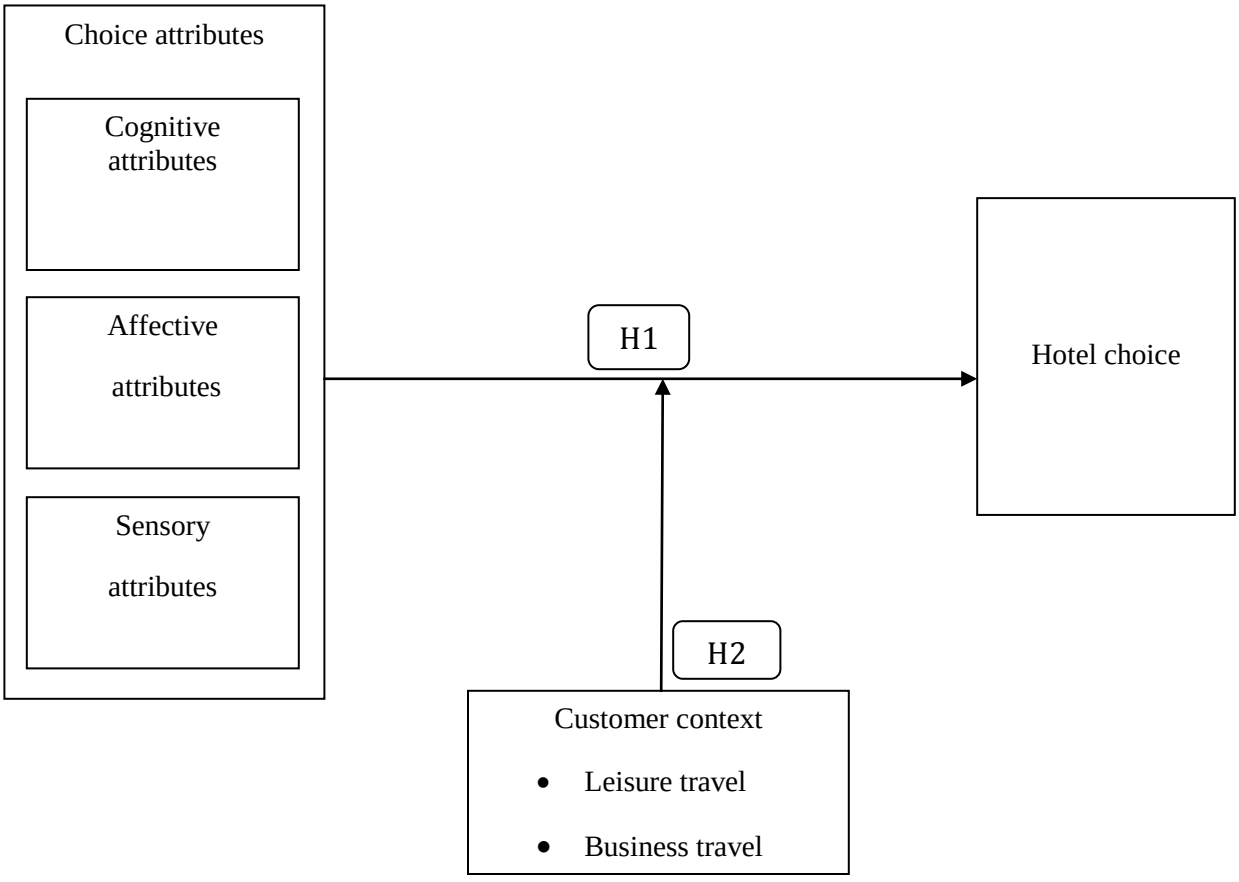
1. What is the relative effect of cognitive, affective, and sensory attributes on hotel choice? Does incorporating an experiential approach into choice modeling help us to better understand hotel choice?
2. How does the choice context influence the relative importance of affective, sensory, and cognitive attributes in hotel choice? What are the moderating effects of the consumer context on the relationship between customer choice attributes and hotel choice?

1.5 Proposed Conceptual Model

Based on the previous discussion, a consumer choice model in the hotel context is proposed in Figure 1.1. The model theorizes that consumer choice behavior is influenced by a cognitive and experiential system, and is a consequence of the effects of cognitive, affective, and sensory attributes. Further, consumer choice in hotel consumption varies depending on the consumer's choice context, which results in different preference structures.

Figure 1.1

Hotel Choice Model of the Effects of Cognitive, Affective, and Sensory Attributes



1.6 Contributions of This Research

The proposed study makes three important contributions to the literature. First, this dissertation determines if an experiential approach should be incorporated into choice modeling to better understand hotel choice behavior. Previous research has focused almost exclusively on cognitive attributes in hotel selection using either information processing or a multi-attribute approach (e.g., Yavas and Babakus, 2003). Existing experiential research in the hospitality literature is mainly conceptual (e.g., Gilmore and Pine, 2002, Pine and Gilmore, 1998) and/or concentrated only on identifying experiential dimensions (e.g., McIntosh and Siggs, 2005, Oh et al., 2007), and neglects cognitive attributes (e.g., price and brand name) and functional utility to understand customer behavior. To date, little research has combined both a cognitive and an experiential perspective to understand customer hotel choice behavior. To the customer, however, the affective experience with the service brand is at least equal in importance to the service itself (Morrison and Crane, 2007) and emotions may constitute the main outcome of the service. In particular, this dissertation emphasizes the importance of customers' affective and sensory attributes in a hotel choice context (e.g., Ladhari, Brun, and Morales, 2008; Liljander and Strandvik, 1997; Mano and Oliver, 1993). Thus, using discrete choice modeling, this study assesses the relative impact of cognitive, affective, and sensory attributes on consumer hotel choice. Through this process, this study shows that the addition of affective and sensory attributes to a base model that includes cognitive attributes helps to better understand hotel choice. Also, this study identifies the trade-offs between cognitive, affective, and sensory hotel attributes on hotel choice.

Second, this study shows that discrete choice experiments (DCEs) provide greater potential than existing multi-attribute methods in hotel choice studies because well-optimized

choice designs can predict hotel choices under different choice scenarios or contexts and can complement the limitations of existing attribute data, while allowing more complex analyses through multinomial logit or mixed logit models. In other words, it goes further than previous hotel choice studies in terms of methodology and offers several insights for the design of other choice experiments in the hospitality literature.

Hotel choice studies have focused on the importance of hotel attributes predominantly through importance ratings or attribute rankings. However, compared to rating or ranking scales, a more complex survey instrument such as conjoint design is necessary for future choice studies in terms of a trade-off situation and utility maximization (Dolnicar and Otter, 2003). In this view, choice-based conjoint (CBC) design[1] is more advanced than the traditional ratings-based or ranking-based conjoint designs since customers are not likely to rate attributes of a product or rank the profiles in real life decisions and DCE better represents real-life choice scenarios (Zhu, 2007). Although DCEs have been applied widely in transport economics, marketing, and environmental and health economics, their application in hospitality and tourism has been relatively limited. Also, as Louviere (2006) pointed out, previous discrete choice experiment (DCE) studies tend to treat analysis as merely a statistical exercise devoid of behavior theory. A well-designed DCE that is more consistent with economic and behavioral theories such as those in this study can elicit the real preferences of hotel customers, and not simply the customers' perception of important attributes since DCE is closer to real market choices in two ways: 1) it considers comprehensive choice attributes simultaneously in each choice set, and 2) respondents

[1] Choice-based conjoint is called CBC, which is one of the designs of conjoint designs such as ranking-based conjoint, ratings-based conjoint, and adaptive conjoint design. In the literature, instead of CBC design, discrete choice experiments (DCE) or discrete choice analysis (DCA) is used. In this study, DCA and DCE are used interchangeably.

are asked to choose the one that best reflects their preferences. This study uses stated choice modeling based on consumer behavioral theories (e.g., CEST and dual process theory) and a conceptual framework, as well as random utility theory (RUT) and the information integration theory of DCEs.

Third, this dissertation identifies the effects of affective and sensory attributes as compared to cognitive attributes on hotel choice as moderated by the customer choice context. Depending on the choice context, customer preference may vary the relative importance of cognitive, affective, and sensory attributes in a hotel choice context. According to choice studies in the hospitality literature, depending on the type of guest, the importance of cognitive and affective (or sensory) attributes may vary (Babakus, Yavas, and Eroglu, 2005). That is, for leisure travelers, affective attributes (responses) should be more important whereas, for business travelers a cognitive approach tends to be used (Cohen, Pham, and Andrade, 2008; Dube and Renaghan, 1999). However, little research has been conducted to assess how customer context affect hotel choice attributes in the stated choice scenario. Following this process, hotel corporations can execute effective marketing strategies by developing and designing products that fulfill customer needs and wants and add value and distinctive experiences both in their choice and during their stays.

1.7 Overview of the Dissertation

This dissertation examines the differential effects of cognitive, affective, and sensory attributes on hotel choice behavior using discrete choice modeling. Chapter I presents an overview of the study, including its theoretical framework, research objectives, and research questions. In Chapter II, a review of the relevant literature is presented. This chapter reviews

choice studies in terms of cognitive, affective, and sensory attributes in both the consumer behavior and the hospitality literatures, as well as provides a review of discrete choice modeling. Chapter III describes the detailed methodology for this research and its related methods, and a summary of research hypotheses. Chapter IV includes analyses and results of the study and Chapter V presents discussions, implications of the study, and study limitations and future research.

1.8 Definitions of Terms

Regarding terminology, there has been confusion about the terms used in the consumer behavior and decision making literature. For this dissertation, I use terms consistently. The types of attributes to be considered consist of cognitive, affective, and sensory attributes. The term "attributes" is used in place of similar words, such as characteristics, features, factors, values, and benefits. Second, the term "cognitive" is used in place of functional, utilitarian, and tangible. Third, "affect" refers to a collection of moods and emotions; "affect" and "emotions" are used interchangeably in this dissertation. Finally, the term "sensory" is used instead of hedonic or intangible. I will classify and define several other important terms.

Affect refers to an internal state of feeling and is a general term used to refer to a collection of moods and emotions (Puccinelli, Goodstein, Grewal, Price, Raghubir, and Stewart, 2009).

Affective attributes (responses) refers to the emotions and feelings that are elicited by features of a target object, where these feature are real, perceived, or imagined based on Cohen et

al. (2008). In this study, affective attributes and affective responses (experiences) are used interchangeably.

Cognition refers to the beliefs and knowledge an individual has about an object, particularly the attributes and benefits associated with a product (Solomon, Bamossy, Askegaard and Hogg, 2006).

Cognitive attributes refers to the physical dimensions or non-physical qualities that satisfy utilitarian needs and provide functional benefits or value.

Cognitive-Experiential self-theory (CEST) proposes that, in any task, two conceptual systems tend to operate in parallel: an experiential and a rational. An experiential system is affective in nature and is associated with crude and rapid processing. A rational system is cognitive in nature and is associated with more refined and deliberative processing (Epstein and Pacini, 1999; Epstein, 2003). Because the experiential and rational systems are interactive, each can influence the other with respect to both content and process.

Consumption emotions are the affective (or emotional) responses generated from consumption and the set of emotional responses elicited during product usage or consumption experiences (Han, Back, and Barrett, 2010).

Consumption experience is the total outcome to the customer from the combination of environment and goods and services purchases (Lewis & Chambers, 2000).

Customer experience is the internal and subjective response customers have to any direct or indirect contact with a company (Meyer and Schwager, 2007).

Discrete choice analysis (DCA) is a modeling approach based on a sound, well-tested, and relatively comprehensive behavioral theory known as random-utility theory (RUT) and

provides a robust and systematic way to identify the relative weights and attribute trade-offs revealed by a decision maker's choices (Verma, Plaschka, and Louviere, 2002).

Experiential marketing is a consumer's developing recognition and purchase of goods and services from a company or brand after they experience activities and are stimulated by the company or brand (Schmitt, 1999). It is distinct in four key ways: focusing on the customer experience, treating consumption as a holistic experience, recognizing both the rational and emotional drivers of consumption, and using eclectic methodologies (Tsaur, Chiu, and Wang, 2006).

Hedonic consumption refers to those aspects of consumer behavior that relate to the multi-sensory, fantasy, and emotive aspects of the product usage experience (Hirschman and Holbrook, 1982).

Hotel choice is the result of the process by which a customer selects, from a set of alternatives, the hotel that is perceived as having the greatest utility and best experiences to satisfy his/her particular needs or wants.

Random utility theory (RUT) was developed to predict the probability that an individual would make a particular choice. It assumes that there exists latent preferences (an observed component and an unobserved or random component) associated with all choices being considered, and that the individual selects his/her most preferred choice (the one that maximizes utility) (Louviere, Islam, Wasi, Street, and Burgess, 2008).

Sense is a consumer's perception and information derived from sight, sound, scent, taste, and touch. Senses are a primary ingredient of the customer experience recipe (Shaw, 2005).

Sensory attributes refer to those attributes that can be directly determined through our senses, particularly, touch, smell, sight, or sound (Degeratu, Rangaswamy, and Wu, 2000).

Utility is defined as judgments, impressions or evaluations that decision makers form about products or services, taking all the determinant attribute information into account (Louviere, 1988).

CHAPTER II

LITERATURE REVIEW

This chapter provides a review of background literature pertaining to choice modeling and the influence of cognitive, affective, and sensory attributes on consumer choice. It consists of two sections: theoretical and methodological. In the theoretical section, I first review choice modeling. Then, I provide the nature of information that influences choice in terms of cognitive, affective, and sensory attributes and a review of the choice research in the consumer behavior and hotel literature. Next, existing measures of the experiential dimensions of consumer choice are discussed and the necessity of integrated attributes based on cognitive and experiential perspectives is suggested. This section also addresses the moderating effects of choice context. In the methodological section, I provide an overview of (1) types of choice studies (revisit intention, revealed, and stated choice), (2) choice modeling research in the hospitality and tourism literature, and (3) discrete choice analysis (DCA) and a design for choice experiments.

2.1 Theories of Choice Modeling

2.1.1 A Review of Choice Modeling

Several early consumer behavior conceptual models focused on consumer decision-making or choice processes (e.g., Howard and Sheth, 1969). These models assumed that cognition mediates affect and directs it, while affect mediates behavior. The C-A-B (cognition-affect-behavior) paradigm, along with other multi-attribute models, was illustrated by Howard and Sheth (1969); Hansen (1972); Engel, Blackwell, and Kollat (1978); Bettman (1979); Fishbein-Azjen (1975).

The Howard-Sheth (1969) model represented a major revision of earlier systematic attempts to develop a comprehensive theory of buying behavior (Schiffman and Kanuk, 1983). Howard and Sheth's (1969) brand choice behavior model describes the buyer's choice sequence from attention and brand comprehension to attitude to intention/purchase. The elements of a buyer's decision are a set of motives, alternative brands, and choice criteria by which motives are matched with alternative brands. Motives are derived from the buyer's needs, wants, or desires related to buying and consuming a product. The choice criteria serve the function of organizing and structuring the buyer's motives in terms of their relative importance. The two sources of choice criteria learning are (a) actual experience (i.e., the experience of buying and consuming with all its cognitive aspects such as reasoning and memory), and (b) information that comes from social (e.g., word-of-mouth) and commercial environments (e.g., marketing stimuli). (Howard and Sheth, 1969)

Similarly, Engel et al. (1978) described a broad model in which perceived information leads, via memory, to problem recognition, search, and the evaluation of alternatives, which in turn leads to choice or purchasing outcomes. That is, they proposed a chain of relationships from information processing to alternative evaluation to purchasing outcomes.

Bettman (1979) pointed out that Howard and Sheth (1969) had examined information processing in terms of learning theory, which is a stimulus-response approach, not a cognitive one. Bettman's (1979) information processing theory provides a more detailed approach to understanding consumer choice processing, including how consumers employ information to arrive at various types of buying decisions as problem-oriented decision makers. He assumed bounded rationality (Simon, 1955), the notion that decision makers have limitations on their capacity and/or working memory for processing information. Over time, this information

processing model moves from general notions to more specific criteria and preferences for alternatives. The relationship between information search and purchasing experience shows an inverted U shape, as advocated by Bettman and Park (1980) and Johnson and Russo (1984). That is, when inexperienced or less knowledgeble, consumers will continue to search information and learn about the different brands available to them, but once they reach the point of saturation or feel confident about their knowledge of the brand, they will reduce their searching (Moorthy, Ratchford, and Talukdar, 1997).

Based on these choice models, consumers select a product from among a set of alternatives using choice criteria that they perceive to have the best potential for satisfying their motives and needs. Consumers integrate information – both prior information in their memories and any information obtained through search (Degeratu et al., 2000). From this perspective, Anderson (1971) provided the logic (called "information integration theory") to test a model of information integration. That is, "Anderson's information integration theory was developed to describe how people combine different pieces of information when forming product evaluations" (Smith, 1993, p.205). "Attitudes or beliefs are formed and modified as people receive, evaluate, and then integrate stimulus information with existing beliefs or attitudes" (Simonin and Ruth, 1998, p.32). Anderson (1971) and Bettman, Capon, and Lutz (1975) used a simple algebraic model to describe judgments and decision making based on multiple sources of information. Their theory assumes that consumers assign importance, weight, and scale values (utilities) to product attributes, and then combine these weights and values according to some rule (e.g., adding or averaging) to come up with an overall evaluation.

Meanwhile, according to Bettman et al.'s (1998) constructive choice view, customer preference is highly context dependent and has multiple goals for a given decision problem. That

is, due to limited processing capacity, consumers do not have well-defined decision preferences for many situations, but construct them using a variety of strategies depending upon the actual choice situation. As cited in Osselaer et al. (2005, p.336), "the utility of specific attributes or attribute levels is highly context-dependent" (Tversky and Kahneman, 1981) and "choices are influenced by the ease with which a decision can be justified to others" (Simonson, 1989). That is, consumers want to minimize the time and effort devoted to the choice (Bettman et al., 1998) and to avoid negative emotions during the alternative evaluation process (Luce, Bettman, and Payne, 2001).

However, there are several limitations to these cognitive choice models (Hansen and Christensen, 2007; Pham, 1998). The information processing models (e.g., Bettman, 1979) and multi-attribute models (e.g., Fishbein, 1965) assume that affect is a result of the process of brand attribute information integration, not a cause (Kwortnik, 2003; Peterson et al., 1986). Pham (1998) and Schwarz and Clore (1996) argued that choice theories shaped by the information processing paradigm tend to ignore the role of emotion or to regard it as the result of a reasoned, cognitive evaluation. Pham (1998) argued that consumers tend to use their feelings as information to make choices by appraising feelings toward the target under consideration. Similarly, Philips, Olson, and Baumgartner (1995, p. 284) claimed that while "multi-attribute models have been successful in modeling how consumers select mundane, frequently purchased products where the problem is well-defined and decision making proceeds rationally, these models cannot account for decisions in which less experience is available, where the problem is not well-structured, and where emotional reactions are important."

In sum, based on the information processing model, customers select the best option from among the alternatives using a cognitive approach. However, there has been a growing

recognition of the experiential view and affective attributes (responses) in customer choice. Accordingly, given both the cognitive and affective attributes of a product, customers search for multiple sources of information to make decisions.

2.1.2 The Nature of Information and Choice Research in the Hotel Literature

This section discusses the nature of information that influences choice. This dissertation bases the multi-dimensionality of the customer experience on the three basic systems (cognition, affect, and sensation,) found in the psychological and behavioral literature (Brakus et al., 2009; Schmitt, 1999; Shaw, 2005; 2007).Thus, based on the three systems, it is necessary to identify the precise attributes that deliver the value customers expect in hotel choice behavior (Dube et al., 2003). The first part reviews the cognitive attributes of alternative products in choice behavior. Next, it discusses the experiential view and the importance of experiential marketing, focusing on the role of affective and sensory attributes on choice. This section also reports key findings from research that has integrated the two approaches, cognitive and experiential processing, in consumer choice modeling.

2.1.2.1 Cognitive Attributes and Hotel Choice

Cognition is the beliefs and knowledge an individual has about an object, particularly its attributes and benefits (Solomon et al., 2006). Historically, consumer behavior studies have focused on assessing cognitive attributes for product evaluation, overall preference, and choice behavior. In cognitive processing, consumers focus on attributes directly related to the product. Cognitive attributes are physical dimensions or non-physical qualities that satisfy utilitarian needs and provide functional benefits or value. Psychologists have used "the term 'cognitive' to

refer to processes involving deliberate, conscious, propositional thought" (Giner-Sorolla, 1999, p. 443). The cognitive approach mainly depends on the knowledge we bring to the experience (Ford and Heaton, 2000). That is, the cognitive definition of experience assumes customer experience as an outcome. In this perspective, *Collins English Dictionary* defines "experience" as the accumulation of knowledge or skill that results from direct participation in events or activities in an event (Collins, 2007). Erevelle (1998) also pointed out that in the context of multi-attribute models, consumers mostly capture cognitive beliefs and evaluations rather than emotional responses. According to Peter and Olson (2005), consumer cognitive processing involves three important cognitive processes: (1) to interpret relevant information in the environment to create knowledge or meaning, (2) to combine and integrate this knowledge to evaluate and choose among alternatives, and (3) to retrieve product knowledge from memory through integration and evaluation processes. When customers do not have enough information or experience to make decisions, they tend to search for external information. When searching for external information, consumers focus on those relevant and descriptive attributes that are available and are diagnostic (Dick, Chakravarti, and Biehal, 1990; Levine, Wyer, and Schwartz, 1994). The cognitive approach tends to attach greater meaning to the stimulus by automatically extracting easily processed stimulus information and associating it with experienced pleasure and arousal (Cohen et al., 2008).

Cognitive attributes are instrumental in fulfilling functional goals (Gursoy et al., 2006). When consumers search, shop, and consume brands, they are exposed to cognitive product attributes (Brakus et al., 2009). For example, in Darke et al.'s (2006) study, product features such as car adapters, average battery life, weight, and retail prices were used to assess the product's utilitarian benefits in terms of cognitive information processing.

As an example of the most influential cognitive attributes, Jacoby, Szybillo, and Busato-Schach (1977) found that customers tend to place behavioral importance on prices and, especially, brand name information. When brand name information is used, consumers are more satisfied with their purchasing decision (Jacoby et al., 1977). Brand name also has a greater influence on choice in an environment where less total information is available to facilitate the choice, such that brand name plays a role in the information acquisition function (Degeratu et al., 2000; Jacoby et al., 1977).

Next, the studies on the effects of cognitive attributes on hotel choice are examined. "Hotel attribute studies have a long tradition in hospitality research" (Dolnicar, 2002, p. 29). Since Lewis' (1984a, 1984b) comprehensive choice research, a number of hotel studies have focused on the determinant attributes used to choose a hotel in terms of cognitive and tangible characteristics (e.g., Callan and Bowman, 2000; Knutson, 1988; McCleary, Weaver, and Hutchinson, 1993; Verma et al., 2005). Lewis (1984a) claimed that hotel choice is a reflection of guests' desired determinant attributes and their perceptions of a given hotel's ability to deliver those attributes. He mentioned price, service, cleanliness, and ambience as determinant attributes in choosing a hotel. Knutson (1988) identified five attributes that business travelers look for when selecting a hotel--a clean and comfortable room, a convenient location, available services, safety, and friendly employees. A survey of frequent travelers by AAAA identified the following attributes as the top five desired hotel attributes: (1) cleanliness, (2) price-value, (3) location, (4) room amenities, and (5) competent, friendly service. In sum, based on existing research, location, price, cleanliness, friendly employees, and attitudes are shown as important choice attributes. Among recent choice modeling studies, Vitorino, Verma, Plaschka, and Dev (2005) used hotel type, technology, and customization attributes in their hotel study.

Also, scholars have examined the differences in choice criteria depending on the type of traveler and travel purpose, hotel type, and demographic characteristics, such as gender, income, and age (e.g., Babakus et al., 2005; McCleary et al., 1994; Yung and Chan, 2001). First, there are distinct differences between business travelers and leisure travelers in choosing a hotel. McCleary et al. (1993) indicated that the important attributes influencing business travelers' hotel choices are cleanliness and location. Yung and Chan (2001) found that a business center and check-in/out encounters had the biggest impact on business traveler satisfaction. In addition, there were preference differences between male and female business travelers. Female business travelers emphasized security and low price, whereas male business travelers focused on business service and facilities (McCleary et al., 1994). Lewis (1984b, p. 74), though, showed that "women's perceptions are not all that different from those of men." Meanwhile, Clow, Garretson, and Kutz (1994) found that security, personal interactions, and room rates were important attributes for the leisure traveler. Siguaw et al. (2006) showed that hotel reputation and advertising promotions were considered more important to leisure guests, whereas recommendations by others, physical facilities, and company-mandated hotels were rated more important by business guests. Customers with high incomes tended to put an emphasis on service and ambient attributes.

Among cognitive attributes, some scholars and hotel managers emphasize the importance of attributes such as price, location, and brand name. Clow et al. (1994) found that price was an important attribute in both initial and repeat hotel selection decisions. For business travelers, good value for money is recognized as important in lower hotel categories, whereas price disappointment is reported in higher hotel categories (Dolnicar, 2002). Brand name was particularly critical for mid-range and upscale hotels (O'Neill and Xiao, 2006). They argued that

hotel branding provides added value to guests by reducing the risks associated with staying at an otherwise unknown property and to hotel companies in building brand loyalty. The importance of Internet access was recognized regardless of traveler type and the convenience of wireless internet access in public and private areas of a hotel affected traveler demand (Beldona and Cobanoglu, 2007).

Service quality, evaluated primarily through employee behavior and attitudes, is a fundamental and important attribute influencing positive customer emotions, satisfaction, and the likelihood of revisiting the same hotel (Choi and Chu, 2001, Hanai et al, 2008; Juwaheer, 2004; Oh, 1999). During customers' hotel stays, interpersonal services and relationships with staff, in particular, contact employees, are more influential than in the initial purchase decision (Ladhari, 2009; Saleh and Ryan, 1992). Juwaheer (2004) found that food and factors related to service quality (i.e., employee's reliability and assurance) were important in the hotel repurchase decisions. In particular, Dolnicar (2002) found that business travelers have high expectations for quality on-site food in terms of convenience to save time. Leisure travelers tend to put more emphasis on sport facilities than business travelers and sport facilities are more salient to travelers who spent between 10 and 50 nights in a hotel (Lewis, 1984a, 1984b).

2.1.2.2 Increasing Recognition of the Experiential Approach

Increasingly, the focus of recent consumer research has been on the experiential view of consumption or consumers' emotional reactions to product consumption. Pine and Gilmore (1999) and Schmitt (1999) argue that companies should provide a quality consumer experience in order to remain competitive in an increasingly commoditized world. Holbrook and Hirschman's (1982) early work suggested a clear parallel between the experiential view and the

cognitive information processing view (e.g., Bettman, 1979) and introduced the experiential view as an alternative to the information processing view to understand consumer behavior. Frow and Payne (2007) argue that to understand the perfect customer experience, it is appropriate to consider the two perspectives of consumer behavior: the information-processing approach and the experiential perspective. Although cognitive product attributes are important in product evaluation, many researchers argue that "experience clues" (Berry et al., 2002) are of equal importance to consumers (Hoegg and Alba, 2008). The experiential view can provide important information for decision-making and choice, and influence subsequent behavioral intentions. The experiential view may provide the symbolic meanings of more subjective characteristics (Holbrook and Hirschman, 1982). When a person responds to an emotionally significant event, the experiential system searches its memory banks for related events. If the activated feelings are pleasant (or unpleasant), they motivate actions and thoughts anticipated to reproduce (or avoid) similar feelings. Meanwhile, Holbrook (1986) claimed that consumption experiences may exert feedback effects through satisfaction with subsequent purchase decisions and brand choices. For example, MacInnis and Price (1987) argued that actual consumption of a product offers tangible sensory experiences, and thus emotional benefits, that can enhance and affect purchase intentions. Barsky and Nash (2002) also claimed that a favorable and memorable experiential environment leads customers to positive emotions and affects satisfaction and subsequent behavioral intentions. That is, affective attributes may play a crucial role in visitor satisfaction and behavioral intentions.

Shaw (2005) and Haeckel, Carbone, and Berry (2003) claim that affect and senses play a significant role in the customer experience. In particular, a main characteristic of the experiential view is its affective basis (Paul et al., 2005). In some decision-making circumstances, reliance on

affect is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world. Thus, this dissertation suggests that the experiential attributes in terms of the experiential perspective (called "hedonic experiences" in Hirschman and Holbrook, 1982) consist of affective and sensory attributes. In the next section, I discuss the role of affective attributes on consumer choice and then examine the impact of sensory attributes on consumer choice.

2.1.2.3 Affective Attributes and Hotel Choice

In contrast to the cognitive definition of experience as an outcome, as cited in Palmer (2010), the *American Heritage Dictionary of the English Language* (2006) provides a more affective and process-based definition that defines "customer experience" as feeling emotions and sensations as opposed to thinking. Affect refers to an internal state of feeling and is a general term used to refer to a collection of moods and emotions (Puccinelli et al., 2009). Schwarz and Clore (1996) argued that affect is used as a synonym for emotion. They claimed (1996 p.434) that "all emotions are affective, but not all affective things are emotions." In a cognitive model, "emotions refer to the consequences of ongoing, implicit appraisals of situations with respect to positive or negative implications for goals and concerns, whereas mood refers to feeling states themselves" (1996, p.434). Derbaix and Pham (1991) argued that affective attributes (responses) deserve specific study since they may be as essential as cognitive processes in fully understanding consumer behavior. More emotional aspects of consumption experience occur to a greater or lesser degree in almost all consuming situations (Holbrook, 1986). Building on Cohen et al. (2008), in this study I define affective attributes (responses) as emotions and feelings that are elicited by features of the target object, where these features are real, perceived, or imagined.

Affective attributes occur rapidly and automatically. Also, affect and emotions as well as affective attributes and affective responses (experiences) are used interchangeably. This dissertation focuses on emotions and feelings as affective attributes, not incidental affect (mood).

Since the mid 1970s, there has been an increasing awareness that while affect may be the result of a cognitive process, it may occur simultaneously or in parallel with cognition (Peterson et al., 1986), or it may precede or direct cognitive processing and judgment (Zajonc, 1980). Affect plays a more functional role in judgment and evaluation (Pham 1998) in that it plays a part in heuristic judgments as well as in the evaluation of the probabilities and outcomes involved in choice. As compared to reason-based responses, Pham, Cohen, Pracejus, and Hughes (2001) argued that affective attributes are better predictors of the number and valence of thoughts people have about products. Pham (2007, p.162) also suggested that judgments and decisions based on affective attributes (responses) are reached more rapidly than those based on descriptive inputs because "affective responses can arise very rapidly and enter evaluations through simple associations". For example, Crosby and Johnson (2007) claimed that feelings directly influence customers' approaches or avoidance tendencies with respect to brands. In particular, Morrison and Crane (2007) argued that affect plays a role in purchase decisions, especially when there is not enough cognitive information to distinguish between alternative products, and affect may supplement cognitive attribute information (Hansen and Christensen, 2007; Peterson et al., 1986). Affect plays a central role in what has come to be known as the dual-process theories of thinking, evaluation, and information processing. Epstein (1990) argues that affective attributes are more important when constraints on processing resources such as time pressure, distraction, or cognitive load increase (e.g., Avnet and Pham 2004; Nowlis and

Shiv, 2005; Pham et al., 2001; Shiv and Fedorikhan, 1999). Thus, affective attributes provide fast and resource-efficient assessments of value.

In terms of behavioral decision theory (BDT), by using heuristics, affect can greatly simplify the information processing involved in making judgments. People's choices may occasionally stem from affective judgments that preclude a thorough evaluation of the options, reducing cognitive effort. Berkowitz (1993) made a distinction between lower order and higher order affective attributes. Under low processing, affect operates through simple heuristic processing. Based on dual process theory, however, Darke et al. (2006) assumed that affect can influence choice through either heuristic processing or systematic processing under high elaboration. Moreover, consumers may appropriately correct their judgments when they learn their feelings are irrelevant (Pham, 1998).

Affective attributes are likely to have an impact on product judgments that are typically based on hedonic, feeling-related criteria (Adaval, 2001; Pham, 1998). In contrast, affect usually has little influence on an evaluation that is based on cognitive criteria (Yeung and Wyer, 2004). Reliance on feelings depends on whether feelings toward the target are regarded as relevant (Pham, 1998). In the purchase stage, affect may serve an informative function, especially if the feeling appears relevant (Puccinelli et al., 2009). Reliance on such feelings can be characterized as the "affect heuristic" or "affect referral" (Wright, 1975) or "*how-do-I-feel-about-it*-heuristic" (HDIF heuristic) (Schwartz and Clore, 1988). Pham (1998) argued that reliance on the how-do-I-feel-about-it-heuristic is more likely when the decision maker has consummatory motives as opposed to instrumental motives. Erevelles (1998) mentioned that affect referral processes require very low levels of effort. Brand associated affect influences brand choice under low involvement conditions. Thus, affect serves as a peripheral cue for low involvement decisions.

Meanwhile, Leventhal (1984) proposed that affective attributes (responses) can arise from two routes: (a) an innate route accompanied by sensory-motor processes; and (b) a memory route, which involves schematic and conceptual processing. Affective attributes (experience) result from cognitive elaboration, which takes context and previous experience into account. Thus, appraisal theories of emotion have provided one possible resolution by proposing that emotions can arise from the rapid cognitive appraisal of features of the environment (Cohen et al., 2008).

In addition, affect-based evaluations are often based on mental images because imaging the consumption experience influences consumers' affective attributes (responses) (Esclas, 2004; Mani and MacInnis, 2001). Imagery can have powerful effects on consumer behavior. Imagery plays a greater role in enhancing value in information processing and is useful as a substitute experience when the benefits of consumption are high and sensory in nature and the cost and risks of product acquisition are high (MacInnis and Price, 1987). Imagery has been demonstrated to increase the intention to perform a behavior such as choice and purchase (Petrova and Cialdini, 2005). Image theory means that most decisions are better understood in terms of intuitive elements, learned rules based on past experience, and personal images (Morell, 2004). Image theory (Beach and Mitchell, 1987; Beach 1990) advanced a similar view in proposing that affective evaluation may work in conjunction with cognitive evaluation. Thus, affect attached to images, including positive and negative affective feelings, influences judgments and decisions. From this perspective, affective attributes of the imagined consumption experience can influence decision making or choice (Philips et al., 1995). A positive emotional experience can especially influence choice behavior (Shiv and Fedorikhan, 1999; Kwortnik and Ross Jr., 2007). This type of affect, sometimes called "anticipated or expected affect" by decision theorists (Loewenstein and Lerner, 2003) refers to predictions about the potential affective consequences of the decision.

Expected affect may provide predictive utility, which is central to the economic theory of choice (Cohen et al., 2008). In a similar context, scholars propose that anticipating satisfaction (Shiv and Huber, 2000), consumption vision (Philips, 1996; Philips et al., 1995), and emotional expectation (Neelamegham and Jain, 1999) affect choice. Consumers may evaluate alternatives by imaging the actual experience with one alternative and assessing the desirability of the alternatives according to affective attributes to this imagined experience (Anand-Keller and McGill, 1994).

Affective attributes are crucial in purchase evaluation and satisfaction (Mano and Oliver, 1993; Wong, 2004). Oliver and colleagues (Mano and Oliver, 1993; Westbrook and Oliver, 1991) related emotional processes to post consumption experiences. The concept of consumption emotion refers to the set of emotional responses specifically elicited during consumption experiences (Westbroook and Oliver, 1991). The results show that during the consumption experience, various types of emotion can be elicited and these customer emotions convey important information about how the customer will ultimately assess the service encounter and overall relationship quality, such as satisfaction and loyalty (Wong, 2004). According to Pine and Gilmore (1998), the best relationships with customers are affective in nature. When companies succeed in not only satisfying certain needs but also making the interactions pleasurable, people are more inclined to stay loyal, even when a mistake is made. Bagozzi et al. (1999) argued that positive emotion is linked to one's decision to stay, whereas negative emotion is linked to the decision to leave. The quantity of negative affective experience is significant, especially for females since they tend to report significantly more negative affective experience than do males (Derbaix and Pham, 1991).

To date, however, the effect of affect on hotel choice has rarely been examined in the hospitality literature. Most studies have focused on emotions customers experience after a hotel visit in the post-consumption process. However, affective influences on judgment and choice may occur through the mental imagery process of the consumption experience without the direct experience of affect.

As noted before, most hotel studies have focused on the emotions customers experience when recalling a hotel visit, not anticipatory emotions. Consumer emotions can be significantly more engaged by certain service encounters and previous experience than by advertisements (Price and Arnould, 1995). For instance, if consumers have previous experience with a particular hotel that experience not only influences their evaluation of the hotel's security, but also affects their evaluation of the hotel's reputation and the behavior of the staff (Clow et al., 1994). They added that in situations where consumers had no experience with a particular hotel chain, their expectations may be influenced by their experiences with other hotels. Guests also tend to use the same hotel if expectations are met or exceeded, while if expectations are not met, guests will look for another facility. In particular, the quality of personal interactions with hotel employees is a critical component of the service quality evaluation when customers, especially leisure travelers, select a hotel for their next stay (Lewis, 1984a). That is, staff friendliness or attitude leads customers to have positive affect such as comfort, welcomed, cared for, and valued. In particular, contact employees play a crucial role in determining the delivery of services and in the emotional responses of customers (Ladhari, 2009). Wong (2004) argued that customers' feelings of enjoyment serve as the best predictor of customer loyalty, and feelings of happiness play a role in the formation of good relationships. Meanwhile, Hanai et al. (2008) emphasize the importance of employee service as a determinant of guests' negative intentions to revisit the

hotel. If employees treat guests rudely and impolitely, the guests become upset and disappointed, and will not revisit that hotel.

Customers' emotions gained through experience play a crucial role in their future behavior because customers' emotions influence their future behavioral intentions, evaluations, and use of word of mouth (Barsky and Nash, 2002; Dube and Menon, 2000; Ladhari, 2009; Mattila and Enz, 2002; Martin et al., 2008; Wong, 2004). Martin et al. (2008) and Ladhari (2009) found that emotionally based satisfaction influenced future behavioral intentions more than did service quality based on cognitive attributes. Specifically, an emotional bond with customers is the key to customer satisfaction and loyalty, and repeat visits (Morrison and Crane, 2007). Thus, affective attributes elicited through staff attitudes or behavior are as important as the service itself in that emotions are key to customer behavior intentions and repurchase behavior.

Previous research has shown that some emotions are more important than others in customer hotel selection and that expected emotions may vary by hotel type (e.g., mid-scale, upscale, and luxury hotel) or customer type (e.g., leisure vs. business travelers). Security is one of the most important criteria in the selection of a hotel (Clow et al., 1994). Hilliard and Baloglu (2008) found that safety features have been found to play a key role in shaping meeting planners' site-selection choices. According to Enz (2009), luxury and upscale hotels, airport and urban hotels, large properties, and new hotels tend to maintain a high level of safety and security. A comfortable stay and security are the most crucial attributes to mid-price hotel guests (Barsky and Nash, 2002). In addition, Barsky and Nash (2002) showed that different emotions (e.g., comfort, content, important, pampered, practical, relaxed, respected, secure, sophisticated, and welcome) play a greater role in the decision making process regarding loyalty behavior among various hotel segments. Thus, hotels should consider the impact of emotions on customer brand

loyalty by hotel level. In luxury hotels, three key emotions (feeling pampered, relaxed, and sophisticated) are important for the intent to return. In mid-price and upscale hotels, comfort, sense of importance, and welcome are important.

Some scholars often use the word "benefits" to express what guests expect instead of the concept of emotions. For example, Dube and Renaghan (1999) examined the benefits guests seek in a hotel stay in terms such as a comfortable stay, a worry-free stay, an enjoyable experience, a feeling of satisfaction, a feeling of relaxation, a sense of security, and a feeling of being pampered. They found that leisure travelers placed emphasis on a comfortable stay, while business and convention travelers were more concerned with functionality such as convenience, productivity, and time savings (Dube and Renaghan, 1999).

Meanwhile, affective attributes on judgment and decision making may occur in the absence of an affective experience (Schwarz and Clore, 1996). In this perspective, imaging the consumption experience influences consumers' affective attributes (Esclas, 2004; Mani and MacInnis, 2001). That is, customers focus on feelings they experience when anticipating a hotel visit. For instance, customers who choose a luxury resort hotel may fantasize hedonic consequences more than those choosing an economy hotel because they may anticipate more fun and pampered feelings. Thus, in some contexts, emotions may precede choice and thus may be anticipatory in nature. Anticipated (or expected) affect can influence decision making (Cohen et al., 2008). As hotel products are essentially experiential (Williams, 2006) and the benefits of consumption are sensory and the product cost and risks are relatively high, elaborate imagery can be a useful substitute experience (MacInnis and Price, 1987). Thus, hotel corporations need to utilize an imagery-eliciting strategy that uses external sources such as vivid pictures, concrete

words, instruction to image, guided imagery in the advertisement, (e.g., websites), and marketing communications.

2.1.2.4 Sensory Attributes and Hotel Choice

According to Shaw (2005), it is critical to understand how human beings acquire information. We use our senses -- sight, sound, taste, touch, and smell -- to gather information around us such as, "What does the product look like?" or "What does the restaurant smell like, pleasant or unpleasant?" Hall (1969) suggests that the human sensory system can be categorized into two components: (1) distance receptors (visual, auditory, and olfactory), and (2) immediate receptors (through the skin, membranes, and muscles) such as temperature, texture, hardness, and shape. In many consumption situations (e.g., viewing a movie or eating at a restaurant), several sensory channels operate simultaneously (Holbrook and Hirschman, 1982).

Human sensory perception is understood to come from immediate, basic, and direct experiences of stimulus attributes (Lin, 2004). Gobe (2001) argued that sensory attributes are immediate, powerful, and can lead to profound changes in consumer attitudes. Since a chosen product can be duplicated by competitors in terms of cognitive attributes, it is necessary to create differentiation by improving its sensory attributes (Raz, Piper, Haller, Nicod, Dusart, and Giboreau, 2008, Gobe, 2001). Schmitt (1999) argued that to manage sensory attributes, marketers need to pay attention to primary attributes, styles, and themes in order to create positive customer impressions. According to Kolter (1973), the main sensory channels for atmosphere are sight, sound, scent, and touch. Taste does not apply directly to the atmosphere and thus this dissertation focuses on the other four senses for sensory attributes.

Sensory attributes (or sensation) and sensory information may be combined to create atmospherics (ambience) and greatly influence customer evaluations, choices, and purchase intentions (Kidwell, Hardsetry and Chiders, 2008). Sensory attributes such as music, lighting, and color that foster ambient factors affect customer pleasure and arousal emotions and behaviors (e.g., Babin and Attaway, 2000; Baker & Cameron, 1996; Turley and Milman, 2000; Wasserman, Rafaeli, and Kluger, 2000). Bloch, Brunel, and Arnold (2003) also claimed that consumers increasingly make brand choices based on aesthetic value and distinctiveness of visual design (Dumaine 1991; O'Shanghnessy and O'Shanghnessy, 2003). For example, Carbone and Haeckel (1994) argued that human appreciation of aesthetics influences the choices they make in designing their environments and choosing what to buy since the visual, auditory, tactile, aromatic, and taste signals emitted by products, services, and the environment form a customer's perception. The importance of the aesthetic experience is reflected in the concept of servicescape (Bitner, 1992) or atmospherics (Kolter, 1973). Bitner (1992) suggested that positive physiological responses (sensation) to the servicescape can result in positive cognitions and emotions. Lin (2004) argued that when we retrieve sensory attributes from the environment, we are processing cognitively by forming a perception of the servicescape prior to emotional responses. Also, our senses are linked directly to emotions (Shaw, 2007). Thus, this study suggests that the sensory attributes may affect the cognitive, and especially affective, attributes.

Meanwhile, some previous hotel choice studies have included sensory attributes together with cognitive attributes in terms of functional and tangible utility (e.g., Callan and Bowman, 2000; Cobb-Walgren, Ruble, and Donthu, 1995; Juwaheer, 2004), including attractiveness of the interior and exterior design, cleanliness of the facilities, bed comfort, and noise. For example, in Callan and Bowman's (2000) study, among 38 hotel choice attributes, there are some sensory

attributes such as comfort of bedroom, well-lit bedroom, hotel ambience, décor in public areas, and bedroom décor. In particular, Dube and Renaghan (2000) and Juwaheer (2004) found that during customer stays, guest room design (or room attractiveness) and exterior are important attributes since these perceptions influence repeat patronage or choice intention (likeliness to return to the same hotel in future).

Wakefield and Blodgett (1994) mention that aesthetic attributes and facility layout in leisure service firms may attract or discourage customers from frequenting a facility. Since managers realize that a good night's sleep is the most important service to business travelers, the comfort of the bed and pillow is one of the most important and decisive sensory attributes. Thanks to Westin's bedding innovation with the "heavenly bed," Westin became one of the top ten new development leaders (O'Neill and Xiao, 2006). Clow et al. (1994) claimed that such things as room décor, furniture, bed, and other amenities all have an impact on service quality and as the price of the accommodation increases, travelers' expectations of these sensory attributes increase. Thus, luxury hotels should invest resources in creating quality service that combines the emotional experience and physical/sensory environment to meet guests' high expectations (Siguaw et al., 2006). The longer a customer stays at a hotel and the more the customer becomes a repeat visitor, the more they tend to regard emotions from a service employee's attitude or behavior and sensory attributes (e.g., interior or exterior of the hotel) as crucial to repeat visits. In the hotel industry, Zemke and Shoemaker (2009) found that the introduction of an ambient scent into a hotel or conference room significantly increased social interactions between meeting participants. Dube et al. (2003) argued that sensory pleasure is chiefly borne of the pleasant sensations induced during the experience. For example, Sandals

resorts invoke associations of three types of pleasure experiences (sensory, social, and emotional).

2.1.2.5 The Effects of Cognitive and Affective Attributes on Hotel Choice

Schmitt (1999) claimed that the ultimate goal of experiential marketing is to create holistic experiences that integrate individual experiences into a holistic Gestalt. Pine and Gilmore (1998) and Schmitt (1999) proposed that experiences are conceptualized as a blend of senses, affect, and cognition. Similarly, Bitner (1992) argued that customers' internal physiological, cognitive, and emotional responses to the servicescape cause them to approach (choose) or avoid service organizations (e.g., hotels, restaurants, retail stores). Based on the previous research, I suggest that customer experiences that influence hotel choice are comprised of cognitive, affective, and sensory attributes.

Experiential marketers view consumers as both rational and emotional human beings with the motivation to achieve pleasurable experiences. Berry, Carbone, and Haeckel (2002) and Mascarenhas, Kesavan, and Bernacchi (2006) argue that companies compete best when they combine cognitive and affective attributes in their offerings in that a customer experience consists of two categories: (1) the functioning of the good or service and (2) emotions and senses. That is, as Mascarenhas et al. (2006) argue, total customer experience should have a blend of both physical and emotional elements along all stages of the customer experience and value chain. According to Orth and Marchi (2007), cognitive attributes offer the most intrinsic advantages for product consumption and usually correspond to product attributes that are linked to basic motivations. Affective attributes relate to how it feels to use the product. These attributes satisfy experiential needs such as sensory pleasure and cognitive stimulation. Yuan and Wu

(2008) define experiential value as customers' perceptions of products or services through direct use or indirect observation and found that both cognitive attributes and affective attributes (customer feelings or attitude such as enjoyment and relaxation) influence customer satisfaction.

Previous research has conceptualized products as having two basic dimensions: cognitive and experiential (Erevelles, 1998). Any product can theoretically be positioned with a cognitive, symbolic, or experiential image since many brands offer a mixture of symbolic, cognitive, and experiential benefits (Park, Jaworski, and MacInnis, 1986). Cognitive-experiential self-theory (CEST), one of the dual information processing theories, provides a theoretical rationale for the usefulness of rational and experiential systems in information processing (e.g., Epstein, 1990, 2003). According to CEST, the experience system utilizes a quick and simple approach when processing information -- relying on the information's "feel" in order to make judgments. This system operates in an automatic, associative, preconscious, and holistic manner and is associated with affective experience, whereas a rational system is logical, rule-based, sequential, process oriented, but high effort and conscious (Epstein and Pacini, 1999; Kahneman and Frederick, 2002).

Scholars suggest that to fully understand the customer choice model and consumption experience, it is necessary to integrate the experiential perspective into existing choice models, based on an information processing perspective that includes imagery, feeling, arousal, senses, and the like (Holbrook and Hirschman, 1982; Peterson et al., 1986). Khan et al. (2005) argued that, because they arose from different theoretical paradigms within consumer research and decision-making, affective and cognitive attributes represent independent product attributes and both perspectives have important implications for how consumers make trade-offs among these attributes depending upon the choice task or context.

Choice criteria for customer choices and decisions may vary depending on the decision context or decision task. Overall, customers tend to choose a functionally superior option in a choice set. According to Berry's (1994) precedence principle, people try to fulfill cognitive needs first before attempting to fulfill experiential wants. Although a cognitive product's attributes and functional benefits are important, they represent only a part of what really drives consumers (Zaltman, 2003). Where alternatives are similar functionally and not differentiated (Hansen and Christensen, 2007; Havlena and Holbrook 1986) or when descriptive information is not easily accessible (Levine et al., 1994), affective attributes or affective processing can affect customers' choice and judgments, leading to brand differentiation (Morrison and Crane, 2007). Brakus et al. (2008) argued that as many products are functionally similar and thus difficult to differentiate on a functional basis, an alternative way to differentiate products is to use affective attributes and/or an experiential context to affect consumer judgments and evaluations because affective attributes can make up for a product's functional inferiority. Specifically, an experiential approach can increase the likelihood of choosing a brand because it adds appropriate aesthetic or emotional appeal to the product when consumers perceive both the affective attributes and the presentation context (the website and stores) as attractive and interrelated. In sum, this study shows that affective attributes can be valuable as a cognitive attribute and supplement the functional inferiority of alternatives. In a similar way, Chitturi, Raghunathan, and Mahajan (2007) found that customers tend to choose a functionally superior option where options in the choice set meet cognitive and sensory cutoffs to minimize negative emotions, but they prefer the hedonically superior option when the choice is between two options that meet or exceed both cognitive and sensory cutoffs to maximize positive emotions. In addition, based on the availability of processing resources, the relative impact of cognition and affective attributes

on choice may vary (Shiv and Fedorikhan, 1999). If the availability of processing resources is high, cognition when choosing the alternatives tends to have a bigger impact on choice. In contrast, if processing resources are limited, affective attributes have a greater impact on choice.

Meanwhile, several studies focus more on the importance of affective attributes than cognitive attributes or functional utility on choice and evaluation in certain realms of consumer behavior (e.g., Gursoy et al., 2006; Neelamiegham and Jain, 1999). Neelamiegham and Jain (1999) show that consumers rely more on their feelings and emotional expectations than cognitive assessment of product attributes in making a movie choice. Similarly, Gursoy et al. (2006) found that affective (or sensory) attributes had a stronger impact on festival attendance than did cognitive attributes. That is, a festival's uniqueness, its symbolic meaning to people, or the emotional arousal and imagery it evokes are likely to influence attendance. In particular, Batra and Homer (2004) argued that such non-functional associations (e.g., sensory/affective attributes) are likely to be more important in determining consumer preference when products are purchased for self-expressive and symbolic purposes.

Previous studies have shown that there are distinguishable differences between attributes that are determinant in initial hotel choice and attributes that are important in repurchase once the guest has stayed at a hotel (Choi and Chu, 2001; Dube and Renaghan, 2000; Knutson, 1988; Yavas and Babakus, 2005). After the initial hotel experience, affective and sensory attributes became more important. Existing research shows that in the initial choice, a convenient location, brand name and reputation, and value for money were the most important attributes, whereas for subsequent visits, sensory attributes or emotions (e.g., guest room design, exterior of the property, and interpersonal service) become more important. In particular, interpersonal services and relationships with staff during reception were differentiated more to create value during the

hotel experience than they were in the initial purchase decision (Barsky and Labagh, 1992; Saleh and Ryan, 1992). That is, after a hotel experience, determinant attributes for repeat stays are sensory attributes such as cleanliness, furnishings and décor, and emotions elicited from employee attitude and efficiency.

Meanwhile, some studies have found that both cognitive and sensory attributes have an influence on repeat patronage and choice intention (e.g., Choi and Chu, 2001; Juwahaeer, 2004). Choi and Chu (2001) found that service quality, room quality, and value were the three most influential attributes in determining a traveler's overall satisfaction and the likelihood of returning to the same hotel. Similarly, Juwaheer (2004) found that both sensory attributes (room attractiveness and décor) and cognitive attributes (reliability, assurance, hotel surroundings and environmental factors, and food and related factors) were important in hotel repurchase intention.

However, other recent studies have shown that sensory and affective attributes were more influential than cognitive attributes in the post-purchase process. That is, affective and sensory attributes play an important role in explaining guests' behavioral intentions such as recommendations to friends and acquaintances, willingness to pay a premium price, and decision to return to the same hotel (Ladhari, 2009; Martin et al., 2008; Wong, 2004). As noted in the discussion of affective attributes and hotel choice, emotional satisfaction is a better predictor of future behavioral intentions than cognitive measures of satisfaction in the context of hotel service (Ladhari, 2009).

In sum, existing studies assume that cognitive attributes and/or some sensory attributes mainly explain hotel choice. In this study, the underlying assumption is that the addition of affective and sensory attributes to cognitive attributes may improve the explanatory power (overall model fit) of the hotel choice model.

To test that argument, I consider four different models. Model 1 (base model) explains hotel choices based on only cognitive variables. That is, the utility of a hotel choice is a function of cognitive attributes only. Model 2 explains the same hotel choices based on cognitive and affective variables. Model 3 examines the hotel choices based on cognitive and sensory variables. Finally, model 4 (full model) examines the hotel choices based on cognitive, affective, and sensory variables. The relative explanatory power of two models is expected to improve as affective and/or sensory attributes are added to the base model. Based on this rationale, six hypotheses are proposed.

H1a*: The explanatory power of model 2, which includes both cognitive and affective attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1b: *When controlling for the cognitive attributes, affective attributes will have a significant effect on hotel choice*

H1c: *The explanatory power of model 3, which includes both cognitive and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1d: *When controlling for the cognitive attributes, sensory attributes will have a significant effect on hotel choice*

H1e: *The explanatory power of model 4 (full model), which includes cognitive, affective, and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1f: *When controlling for the cognitive attributes, affective and sensory attributes will have a significant effect on hotel choice*

2.1.3 Review of Experiential Measures in the Hotel Context

This section briefly reviews experiential measures. In particular, this study examined affect measures in consumer behavior and hospitality literature. Finally, this dissertation proposed the necessity of integrated attributes, based on both cognitive and affective perspectives in the hotel context.

2.1.3.1 Review of Experiential Measures

As noted, Pine and Gilmore (1998) and Shaw (2005, 2007) posited that experiences are a blend of cognitive, affective, and sensory elements. Bitner (1992) proposed that an appropriate measure of cognitive, emotional, and physiological responses (experiences) to environments should be developed. However, there have been only a few studies that measure brand experience in consumer behavior (e.g., Brakus et al., 2009). Brakus et al. (2009) developed a scale to measure brand experience using various brands and found four dimensions: sensory, affective, intellectual, and behavioral experience. Although Brakus et al.'s (2009) study used a systematic process of scale development, the behavioral scale is not likely to be experienced in a hotel choice situation since the scale relates to customers' physical actions and bodily experiences.

Meanwhile, several researchers assert the multi-dimensionality of the customer experience (Brakus, 2001; Gentile, Spiller, and Noci, 2007; Hirschman, 1984; Schmitt, 1999; Shaw, 2005; 2007). Schmitt (1999) proposed five different types of experiences in experiential marketing: sensory (sense); affective (feel); creative cognitive (think); physical, behaviors, and lifestyle (act); and social-identity (relate). However, Schmitt's (1999) behavioral and relational scales are not appropriate in the hotel choice context since the behavioral scale is more

motivational and inspirational; relational value expands beyond the individual's private feelings and relates to a reference group or culture. Although Brakus (2001) argued that consumer experience consists of five types of experiences (sensory, affective, intellectual, bodily, and social), his studies focused on sensory, affective, and cognitive experiences. Hirschman (1984) asserts three consumption motives for experience seeking: cognitive stimulation (cognition experience), sensory stimulation (sensory experience), and novel stimulation (novel experience). Gentile et al. (2007) suggested six dimensions of the customer experience: sensorial, emotional, cognitive, programmatic, lifestyle, and relational. Shaw (2005, 2007) argued that a customer experience is not just the physical, or just the emotional, or just the senses, but is "a blend of an organization's physical performance, the senses stimulated, and the emotions evoked, each intuitively measured against customer expectations across all moments of contact" (Shaw, 2005, p. 51). This dissertation is based on Shaw's (2005, 2007) definition of a customer experience (i.e., cognitive, affective and sensory).

Several recent experiential studies have focused on scale development or key dimensions of the hotel experience (e.g., Knutson, Beck, Kim, and Cha, 2009; McIntosh and Siggs, 2005; Oh et al., 2007). Oh et al. (2007) identified four dimensions of experience (education, aesthetics, entertainment, and escapism) in the bed and breakfast accommodation context, based on Pine and Gilmore (1998). However, this study has limitations. First, Pine and Gilmore's framework is more appropriate to retail settings and events (Brakus et al., 2009). Second, although the aesthetic dimension appears to be a dominant determinant of the experiential outcomes in the hotel industry, the education dimension is not appropriately applied to hotel experiences since this dimension is more related to special programs. Similarly, McIntosh and Siggs (2005) revealed five key experiential dimensions (unique character, personalized, homely, quality, and

value added) important to the success of boutique accommodations through in-depth interviews with owners and guests. As a qualitative study, this study provides insights into the experiential nature of boutique accommodations. However, it is potentially limited in its application to all hotel types. As another example, Knutson et al. (2009) found four dimensions of the hotel guest experience (benefits, convenience, incentive, and environment), but this study does not provide a detailed explanation of the item generation and reduction process. In addition, they focused on value, service quality, and satisfaction for item generation without focusing on the experience itself or related key concepts such as experiential marketing, affect, or sensation. Their four factors do not cover affective aspects even though affect is the essence of the customer experience (Shaw, 2007). Table 2.1 summarizes previous customer experience dimensions in the consumer behavior and hospitality literature.

In summary, previous experiential studies in the hotel literature have measurement limitations: (1) some measures were developed in a specific accommodation context (e.g., bed and breakfast or boutique accommodation), and/or (2) they do not cover the multi-dimensional perspective of the customer experience in that customers are both emotionally and rationally driven (Schmitt, 1999). Thus, it is necessary to use integrated dimensions based on cognitive and affective perspectives for the hotel consumption experience.

Table 2.1 Customer Experience Dimensions in the Consumer Behavior and Hospitality Literatures

Author	Experiential Dimensions
Hirschman, 1984	Cognitive experience, sensory experience, and novel experience
Schmitt, 1999	Sensory experiences (sense), affective experiences (feel), creative cognitive experiences (think), physical experiences, behaviors and lifestyle (act) and social-identify experiences (relate)
Brakus, 2001	Functional, affective, and sensory experiences
Schmitt, 2003	Product experience, the look and feel, and experiential communications
Shaw, 2005, 2007	Physical performances, senses, and emotions
McIntosh and Siggs, 2005	Unique character, personalized, homely, quality, and value-added
Gentile et al., 2007	Sensorial, emotional, cognitive, pragmatic, lifestyle, and relational
Oh et al., 2007	Education, aesthetics, entertainment, and escapism
Tynan and McKechnie, 2009	Sensory, emotional, functional (utilitarian), relational, social, informational, novelty, and utopian value
Knutson et al., 2009	Benefits, convenience, incentive, and environment
Brakus et al., 2009	Sensory, affective, intellectual, and behavioral experience

2.1.3.2 Review of Cognitive and Affective Measures

2.1.3.2.1 Cognitive Measures

The existing hotel choice research has not been consistent in the attributes studied. Researchers have used different attributes according to their own perspectives and research purposes and consequentially have obtained different underlying factors. For example, McCleary et al. (1994) found 12 factors drawn from 53 hotel choice attributes. Juwaheer (2004) found nine

factors out of 39 hotel service quality attributes. In sum, hotel studies investigating the importance of attributes are not consistent in terms of primary research interests, the attributes included, the market segment, and the data technique applied (Dolnicar and Otter, 2003). Moreover, most hotel choice studies have not considered affective attributes.

2.1.3.2.2 Affective Measures

Experiences are emotional and personal (Pullman and Gross, 2004). Thus, much of the experience research in marketing and consumer behavior is focused on the importance of affective attributes (responses) (Cheng, Wu and Yen, 2009). However, one of the key challenges in studying affect is the difficulty of measurement.

Many studies in psychology and marketing have proposed affect measures (e.g., Izard, 1977; Mehrabian and Russell, 1974; Richins, 1997; Plutchik, 1980). Traditionally, consumer behavior research has utilized previous emotion measures (e.g., Izard (1977); Plutchik (1980); Mehrabiand and Russell (1974)) in consumption experience and shopping contexts (Bagozzi, Gopinath, and Nyer, 1999). For example, Izard's (1977) framework of emotion consists of ten differential emotion scale (DES) items: joy, sadness, interest, anger, guilt, shyness/shame, disgust, contempt, surprise, and fear. Plutchik's (1980) scale contained eight items: anger, joy, sadness, acceptance, disgust, expectancy, surprise, and fear. Mehrabian and Russell's (1974) pleasure-arousal-dominance (PAD) scale has been popular in marketing research (e.g., Pullman and Gross, 2004), and in particular, in the retailing context, as it contains 18 semantic differential items, six each for pleasure, arousal, and dominance. Similarly, Holbrook and Batra (1987), using a battery of emotional dimensions from a variety of sources, identified three basic emotional dimensions: pleasure, arousal, and dominance. Although the above frameworks

provide useful insights, researchers have criticized them since negative emotions seem to predominate and many daily emotions are omitted (Richins, 1997). Also, the PAD scale uses semantic differential items in which the two anchor points are not always clear opposites, which potentially caused confusion among respondents.

Schmitt (1999) assessed that Richins' (1997) consumption emotions set (CES) with its 16 descriptors is the best measurement covering the emotional reactions most commonly experienced in a variety of consumption situations (e.g., anticipatory consumption, purchase, food, cars, and services). It is statistically reliable and brief enough to be used by managers in field studies of consumption experiences. As a result, the CES could be used to operationalize emotions in more empirically oriented studies. However, since CES was developed to measure a broad range of consumption contexts, it cannot be applied directly in the hotel context. Some emotion items (e.g., envy, loneliness, sadness) are unlikely to be experienced in a hotel consumption situation.

Recently, several scholars have provided emotional attributes that can be applied to the hospitality industry. For example, Pullman and Gross (2004) divided emotion measures into basic emotions and VIP emotions. Basic emotions are measured by comfort, relaxed, happy, satisfied, entertained, amused, and pampered, while VIP emotions are measured by sophisticated, privileged, important, cool, inspired, curious, part of the show, and excited. Han et al. (2010) illustrated the appropriate procedure for developing a scale in the full-service restaurant setting; they developed consumption emotion scales (excitement, comfort, annoyance, and romance) using 32 emotional experience attributes. Overall, their study provides a good list of emotional attributes that can be applied to the development of affective experience scales in the hospitality industry. However, some items (e.g., amazed, curious, hopeful, and passionate) may not be

appropriately applied to a customer's hotel experience. Furthermore, emotional experiences are not the only factors leading to hotel choice behavior, since it is also influenced by cognitive attributes (e.g., price, location, etc.) and thus cognitive attributes also need to be included to explain consumers' choice behavior. Barsky and Nash (2002) developed a hotel emotion scale and emphasized the importance of emotion as a key to hotel loyalty. Although Barsky and Nash (2002) showed the effects of different emotions on loyalty to different hotel types, they only focused on emotions and did not deal with cognitive and sensory experiences. However, as Brakus et al. (2009) pointed out, emotions are only one internal outcome of the stimulation that evokes experiences.

In summary, while the study of experiential views and consumption experience has increased in the consumer and hospitality literature, the appropriate measure to cover both cognitive and affective attributes in hotel consumption situations still remains unresolved. The existing measures of each attribute are not appropriate for integrating the two different approaches -- cognitive and experiential. Measures used in previous research, such as Richins' (1997) CES, Oh et al.'s (2007) four dimensions, and Han et al.'s (2010) four measures are inadequate for this study on hotel choice behavior since this dissertation proposes that customer choice behavior is simultaneously driven by cognitive, affective, and sensory attributes.

2.1.4 The Moderating Effects of Choice Context

This study proposes a choice model primarily focused on the impact of cognitive, affective, and sensory attributes on hotel choice behavior. Kraus (2000) noted that consumer beliefs about the relative value and importance of alternative decision criteria may be dynamic and subject to contextual influence. That is, the value and importance of any point of product

differentiation depends on its perceived relevance to the choice context. Based on this logic, this section examines a specific condition in which consumer choice is influenced by the type of experience. In particular, this section compares hotel choice behavior according to two different types of customers with different contexts and identifies the differential role of the cognitive, affective, and sensory attributes.

Every choice is made within a decision context that is likely to affect the choice and it is necessary for researchers to clearly define the context in which customers are to assess choice sets in order to make a meaningful decision (Hensher at al., 2005). The choice criteria for customer choices may vary depending on the decision context. The hotel choice context consists of leisure (or pleasure) and business travel. In this dissertation, I assume that leisure and business travelers have distinct travel purposes (e.g., holiday, sales meetings) and different preferences for choice attributes.

In the hospitality literature, depending on the type of guest (e.g., business vs. leisure travelers), the importance of cognitive and sensory attributes may vary (Babakus et al., 2005; Lewis, 1984b). Leisure travelers showed higher perceptions to overall feelings, image, reputation, and health facilities as compared to business travelers (Lewis, 1984b). Specifically, Cohen et al. (2008) argued that affective attributes are perceived to be more relevant when the consumer has experiential motives, or when the judgment or decision is inherently affective (e.g., satisfaction). Clow et al. (1994) found that security and personal interaction were important for leisure travelers. Sensory attributes such as attractiveness of exterior design/appearance and attractiveness of interior design/lobby are more important to leisure travelers. In sum, as leisure travelers tend to seek fun and enjoyment, they will place greater weight on affective and/or sensory attributes than on cognitive attributes, with the exception of price, when compared to

business travelers. Overall, leisure travelers tend to be more price sensitive than business travelers (Clow et al., 1994; Knutson, 1988).

Cognitive attributes such as access to computers, a fitness center, and frequent guest programs are significantly more important to business travelers. That is, as business travelers tend to seek convenience and productivity, they will have a greater preference for cognitive attributes, with the exception of room quality. Thus, they are influenced more by cognitive attributes (e.g., location, brand name) than affective (e.g. entertaining) or sensory attributes (e.g. ambience or atmosphere) in hotel choice as compared to leisure travelers. Because a good night's sleep in a room equipped with a comfortable bed is the most important service to business travelers, they place greater weight on room quality, which is related to work productivity.

Because of the data structures of my study, my ability to test the study hypotheses at the construct level was limited. Consequently, I tested them at the attribute level, but attempted to organize and summarize by construct. Therefore in hypothesis 2, I discuss my findings both by attribute and by construct that groups the attributes.

Thus, four related hypotheses are proposed:

H2: *The relative preference of cognitive, affective, and sensory attributes on hotel choice is moderated by choice context*

H2a: *In the leisure context, hotel choice will be more affected by affective and sensory attributes than by cognitive attributes*

H2b: *Leisure travelers will be more influenced by price on hotel choice than are business travelers*

H2c: *In the business context, hotel choice will be more affected by cognitive attributes than by affective and sensory attributes*

H2d*: Business travelers will be more influenced by room quality than are leisure travelers*

2.2 Methods of Choice Modeling

This section presents an overview of discrete choice modeling and reviews the design of choice experiments. First, it examines the types of choice studies such as revisit intention, revealed, and stated choices. Next, choice modeling studies in the hospitality and tourism literature are discussed from a methodological perspective. Finally, a review of discrete choice analysis (DCA) is provided, including the methodological challenges in combining different types of attributes into stated choice modeling and the experimental design of DCA.

2.2.1 Types of Choice Studies

Understanding the choice behavior of customers is crucial for effective service management and marketing success in the hospitality industry (Verma, Thompson, and Louviere, 1999). Previous choice studies on consumer behavior were undertaken using three dimensions: revisit intention, revealed choice, and stated choice.

2.2.1.1 Revisit Intention

Revisit intention is one of behavioral intentions (e.g., repurchase and word-of-mouth intentions) that are crucial factors affecting business profitability and future success because retaining customers or enhancing repurchase intention is much more cost effective, as compared to attracting new customers (Jones, 1998). The existing hospitality choice research is based on reviews of consumer revisit intentions after a hotel stay or experience. Revisit intention is measured as a strong intention to visit the hotel again (Kim, Kim, and Kim, 2009). Revisit intention may be influenced by satisfaction, perceived quality, and consumer emotions. First, the major stream of previous research on revisit intention relates to satisfaction (Um, Chon, and Ro,

2006). Although a few scholars (e.g. Mittal, Ross, and Baldasare, 1998; Um et al., 2006) argue that satisfaction and repurchase intention are different and revisit intention is not an extension of satisfaction, previous research has revealed that consumer satisfaction influences repeat purchase and behavior (Oliver, 1980; Petrick and Backman, 2002; Sirgy and Tyagi, 1986), as well as brand loyalty (Baker and Crompton, 2000). In particular, most studies of consumer satisfaction in the service industry show a positive relationship between satisfaction and repurchase intention (Cronin and Taylor, 1992; Getty and Thompson, 1994).

In addition, revisit intention may be influenced by perceived service quality (Oh, 1999; Wakefield and Blodgett, 1999; Zeithaml, Parasuraman, Leonard and Berry, 1996) and emotions (Barsky and Nash, 2002; Martin et al., 2008). Zeithamal et al. (1996) found that perceived service quality is a determinant of a consumer's tendency to say positive things, to recommend, and to remain loyal a company. Several researchers regard perceived service quality as a cognitive evaluative judgment (e.g., Kim and Moon 2009; Ladhari, 2009). In Oh's (1999) holistic model based on the luxury hotel context, service quality that is affected by price and performance perception of cognitive attributes directly influences consumer satisfaction and indirectly repurchase intention through satisfaction. As previously noted in the discussion of affect and hotel choice, consumer emotions influence their revisit intentions (Barsky and Nash, 2002). In sum, revisit intention is affected by cognitive attributes (perceived service quality), affective attributes (emotions), and consumer satisfaction.

2.2.1.2 Revealed Choice

Revealed choice modeling is based on observations of the choices made by individuals in a real environment and represents the current market situation better than stated choice modeling

(Swait, Louviere, Williams, 1994). Revealed choice behavior based on field data (i.e., scanner panel data) enables estimation from inputs (e.g., the product attributes, socioeconomic characteristics, experience, market information, and constraints) to outputs (e.g., purchase decisions and related market behavior) (McFadden, 1986). Revealed choice behavior in consumer literature is examined by two perspectives: information processing and revealed preference (RP) models based on RP data.

Information processing studies focus on how consumers make choices based on how they evaluate attribute information and combine these evaluations to make choices (Garbarino and Edell, 1997). A large number of previous studies have predicted choice behavior from the multi-attribute attitude models, using aggregate data for prediction (Lutz and Howard, 1971; Kahn and Meyer, 1991). Reibstein (1978) argues, however, that the probabilities of brand choice based on the multi-attribute attitude model are not related to actual brand choice because it is not appropriate to apply Luce's Choice Axiom (Luce, 1959) to attitudinal data. Also, a number of choice studies have focused on the importance of choice criteria and evaluation in decision making and employed exploratory factor analysis to determine the underlying dimensions of choice behavior. Babakus, Eroglu, and Yavas (2004) argue that this approach cannot capture the important higher-level abstractions and cannot identify choice patterns of criteria that are not available at the attribute level.

Economists have relied on 'revealed preference' (RP) data that consist of observations of the actual choices (Crouch and Louviere, 2001). That is, RP data are observations of choices made by individuals in real environments. One way to determine an individual's actual probability of brand choice is to collect purchase panel data and to predict the share of purchases for each brand. For instance, Guadagni and Little (1983) used scanner panel data on coffee

purchasing to predict the share of purchases by brand and size. Using these data, however, has several limitations. First, this process is both time consuming and costly as researchers need a large number of trials to extract accurate estimates of the probabilities (Reibstein, 1978). Second, using revealed preference data does not identify the relative importance of various choice attributes from a consumer's point of view. We do not know choice trade-offs in reality based on revealed choice data. To deal with these problems, some researchers have recognized the value of stated choice models in that DCA based on stated choice data can provide accurate and unbiased estimates of the trade-offs.

2.2.1.3 Stated Choice

As one representative stated choice method, conjoint choice models have been used in the consumer choice literature as an approach to predict consumer choice behavior (Stemerding, Oppewal, and Timmermans, 1999). Conjoint analysis and DCA appear to be very similar to each other,[2] but there are some differences in terms of underlying theory, statistical models, experimental design, and the data collection approach (Verma et al., 1999). That is, based on the deterministic character of choice, conjoint analysis helps marketers find product attributes that are more or less important for a consumer and predict consumer purchasing patterns. The use of deterministic conjoint analysis to forecast is not appropriate because choice behavior across individuals is a probabilistic phenomenon (Louviere and Woodworth, 1983) and conjoint response data are obtained in the form of rating or ranking experimental profiles (Verma, Thompson, Moore, and Louviere, 2001). Also, Louviere and Woodworth (1983) argue that because the data of conjoint analysis are judgments or evaluation tasks and the variations in

[2] DCA is one of type of conjoint analysis.

choice behavior are limited, these sources of variation in choice are not appropriate for understanding variations in choice processes and for forecasting choices. For this reason, a more advanced method, DCA (or DCM) is more prevalently used to represent the real trade-offs revealed by consumers' choices and to identify the relative importance of attributes.

Stated choice modeling asks respondents to make discrete choices in each of a number of designed scenarios using stated preference (SP) data. Stated preference data are choices made by real respondents in hypothetical choice scenarios, which have been carefully designed by the investigators. Stated choice models based on stated preference data represent a way of identifying consumer utility functions and choice structures (Stemerding et al., 1999). The main advantage of using discrete choice modeling is the ability to obtain consumers' real choice drivers and the differences in relative importance based on the type of consumers and purpose. McFadden (1986) developed a multinomial logit model (MNL) that combined the hedonic evaluation of alternatives and random utility maximization and that is used for field and experimental choice data. Since Louviere and Woodworth (1983) provided the conceptual foundation to design practical multiple choice experiments, there have been many advances in the understanding of experimental designs and choice modeling (Crouch and Louviere, 2001).

Compared to RP models, SP choice models have their own strengths and characteristics. First, SP models are more robust than RP models in that SP models can be designed to eliminate or at least significantly reduce the difficulties of RP data, such as collinearity and/or variability (Louviere, Hensher and Swait, 2000). Stated preference models are rich in attribute trade-off information in that they do not experience a lack of variability because the attributes in the choice tasks are varied on the basis of an experimental design devised by the analyst. Revealed preference models (observational data) cannot satisfy model assumptions and/or contain

statistical problems because RP models frequently have little variability and are highly collinear in the marketplace. An analyst can avoid this collinearity problem in a stated choice task by using an orthogonal design. That is, attribute effects that were weakly identified or previously unidentified due to collinearity can be clearly identified (Adamowicz, Louviere, and Williams, 1994).

Second, SP data are more useful for forecasting changes in behavior. It describes hypothetical or virtual decision contexts and controls relationships between attributes, which permits mapping of utility functions with products that are different from existing ones. Stated preference models can include the range of the proposed changes within the data, whereas actual data do not encompass the range of proposed changes in attribute levels (Adamowicz et al., 1994). As RP data depict the world as it is, they have only existing alternatives. That is, as RP data do not reflect what was considered and rejected, RP models only contain information about preferences for existing options and thus researchers cannot accurately detect and define the nature of a non-choice decision (Crouch and Louviere, 2001).

Third, SP models can support important managerial decisions, including the determination of optimal configurations of alternative characteristics, market segmentation, and simulations of market responses (Baltas, 2006). Stated preference models may prove to be useful for enriching estimation, cross-validation models, and/or rescaling models from choice experiments to better match choices in the real market. That is, SP surveys can produce data consistent with economic theory from which econometric models can be estimated (Louviere et al., 2000). As an example of the simulation of optimal response, when organizations need to estimate demand for new products with new attributes or features, it is often essential to design SP models to provide insight into the likely market response to such new features because the

use of stated preference data allows researchers to model the demand for new products and new attributes that do not exist in real environments (Albaladejo-Pina and Díaz-Delfa, 2009; Swait and Andrews, 2003). However, when we use RP data, even if new features or choice options are added, there is no information about how preferences and choices will change.

Finally, SP data are much less expensive to obtain and usually can be collected much more quickly, whereas RP data are time consuming and expensive to collect (Louviere et al., 2000). That is, as previously noted, using RP data may be very time consuming and costly because researchers need a number of trials to extract accurate estimates of the probabilities (Reibstein, 1978). To address the issues outlined above, some resource economists have come to rely on SP theory and methods. Stated preference models based on stated choice data are attractive to academics and practitioners because they can avoid the problems associated with RP data (Crouch and Louviere, 2001).

However, there are drawbacks involved in using stated choice models (Huybers, 2005). A key issue is the external and predictive validity of choice experiments (Crouch and Louviere, 2001). That is, there may be model validity problems because the choices are not observed in an actual choice situation. Also, it cannot be confidently assumed that respondents can handle the changes in attributes across choice sets adequately if these changes exceed a marginal level.

In sum, the use of stated choice methods based on carefully designed choice experiments makes possible the investigation of choice factors that lie outside the scope of past and present selection behavior based on revealed preference data (Crouch and Louviere, 2004). In particular, if the primary interest is valuation, SP data may be sufficient. A key role for SP data in combined SP-RP analyses lies in data enrichment (e.g., Ben-Akiva and Morikawa, 1990), which provides more robust parameters estimates (Louviere et al., 2000).

2.2.2 Review of Choice Modeling Research in the Hospitality and Tourism Literature

Previous hotel choice studies have tended to adopt revealed choice (i.e., importance of attributes) and/or revisit intention by focusing on cognitive and sensory attributes. Hotel studies, to date, have focused on the important attributes of hotel selection and revisit or satisfaction/disappointment, mainly using factor analysis and descriptive statistics (e.g., Ananth, DeMicco, Moreo, and Howey, 1992; Clow et al., 1994; Lewis, 1984; Dube and Renaghan, 1999; Dolnicar, 2002; Shanka and Taylor, 2003). These studies have asked respondents to rank/rate the importance of hotel attributes (e.g., Callan and Bowman, 2000; McCleary et al., 1994). Previous research suggests that initial choice attributes are different from repeat attributes and revisit intention is strongly influenced by satisfaction/dissatisfaction (e.g., Choi and Chu, 2001; Dube and Reneghan, 2000; Knutson, 1988; Siguaw et al., 2006). In particular, revisit intention research places an emphasis on the importance of satisfaction (e.g., Barsky and Labagh, 1992; Cadotte and Turgeon, 1988; Gundersen, Heide, and Olsson, 1996). In repeat patronage, service quality and emotions from service encounters play an important role (Hanai et al., 2008).

However, we do not catch the actual trade-offs of customers in the decision process, without understanding the role of affect on decision making. Previous hotel choice studies, based on revealed choice data and repurchase intention, are limited in identifying a consumer's real preference in terms of both cognitive and affective attributes.

In the hospitality and tourism industry, many choices are extremely complex in that many product and service bundles are considered simultaneously. In this context, discrete choice analysis can be an effective method to assess the trade-offs that consumers make in considering various product and service combinations and thus to determine real preference (Crouch and Louviere, 2001). In the hospitality and tourism literature, researchers have used choice modeling

to predict hospitality and tourism product choices, including (a) hotel (Verma and Plaschka, 2003; Victorino et al., 2005), (b) pizza (Verma and Thompson, 1996; Verma et al., 1999), and (c) travel mode (Kelly, Haider, Williams, 2007). For example, Verma et al. (1999) showed that pizza delivery industry profiles are designed based on seven attributes, identified customer pizza choice patterns, and manager perceptions of customer choice using discrete choice analysis (DCA). Victorino et al. (2005) applied discrete choice analysis to model customer preferences for various hotel service innovations and found that service innovation is important in a customer's hotel choice at economy hotels, in particular. By assessing the relative weight given to different characteristics by different customers and contexts, managers can identify and optimize desirable product and service offerings (Victorino et al., 2005). Choice modeling has also been used to select destination choices, such as convention sites and heritage destinations (e.g., Alexandros and Jaffry, 2005; Crouch and Louviere, 2004; Huybers, 2005), which is the most fruitful research field. For instance, Crouch and Louviere (2004) demonstrated the application of stated choice modeling to assess convention site attributes and revealed that choice experiments are powerful ways to obtain preference or choice information. Alexandros and Jaffry (2005) presented an application of systematic heterogeneous discrete choice modeling that introduces the effects of individual/situational characteristics in choice probability in the area of heritage resource evaluation. Recently, Albaladejo-Pina and Díaz-Delfa (2009) examined tourists' preferences for the effective attributes of rural houses in an accommodation choice context using discrete choice modeling. In sum, DCA studies in the hospitality and tourism literature have been applied to various hospitality products such as hotels, pizza, and travel models, and to destination choice and vary a great deal in terms of complexity and sophistication.

2.2.3 Review of a Discrete Choice Analysis (DCA)

2.2.3.1 Overview of DCA

Previous choice studies have dealt with revisit intention, revealed choice models, and stated choice models (i.e., DCA) in the consumer behavior literature. Because DCA provides respondents' real trade-offs and identifies the relative importance of choice attributes in dynamic and complex choice contexts, many researchers (e.g., Louviere and Woodworth, 1983; Verma, et al., 1999) have conducted DCA studies since McFadden (1974) applied MNL to multiple choices. Lancsar and Louviere (2008) argue that DCA resulted from advances in many different disciplines: information integration theory in psychology, random utility theory-based discrete choice models in economics, and discrete multivariate models (e.g., multinomial logit, mixed (random parameter) logit, and nested logit model) for optimal experimental design in statistics.

Thurstone (1927) first proposed *random utility choice models* as a way to study and model choices between pairs of options. McFadden (1974) significantly advanced Thurstone's (1927) contribution by spreading RUT to multiple choices. He assumed that the random components (i.e., random error) were independently and identically distributed (IID) Gumbel random variates. Since Louviere and Woodworth (1983) pioneered the conceptual foundation for designing practical multiple choice experiments, DCAs have been widely used to evaluate product preferences and to predict customer choice by designing choice scenarios.

Discrete choice analysis (DCA) provides a useful means of collecting individual preference data to measure variations in choice behavior under varying scenarios (Louviere et al., 2000). Discrete choice analysis is "a robust and systematic way to identify the relative weights and attribute trade-offs revealed by decision makers' choices" (Verma et al., 2002, p.15). Crouch and Louviere (2004) argue that DCA is a modeling approach based on a sound, well-tested, and

relatively comprehensive behavioral theory, random utility theory (RUT) (Manski, 1977; Thurstone, 1927), which recognizes that preferences have both deterministic (observed) and stochastic (random) components (Louviere et al., 2008). Random utility theory was developed to predict the probability that an individual would make a particular choice. In a choice modeling experiment, respondents are presented with a series of choice scenarios (choice sets) that approximate (or simulate) actual choice situations. Random utility models use the theoretical framework of utility maximization and heterogeneity in decision-makers and choice alternatives. That is, the decision-maker chooses the alternative that he/she perceives as having the maximum utility. In particular, RUT plays a role in linking behavior observed in experiments, surveys, or stated preference data and behavior observed in real markets (Louviere, 1994; Swait and Louviere, 1993).

2.2.3.1.1 Multinomial Logit Model (MNL)

For over 30 years, the multinomial logit model (MNL) has been the recognized, popular standard in discrete choice analysis, which assumes the independence of irrelevant alternatives (IIA). The multinomial logit model (MNL) is a good approximation for choice data. An individual's overall preference for a choice alternative is a function of the utility that the individual has for the choice (Gensch and Recker, 1979). An individual's utility for an alternative consists of two components: (1) a deterministic component in terms of the individual's attitude toward the alternative, and (2) an unobserved random component.

The equation to measure utility is:

$$U_{ij}^{k} = V_{iJ}^{k} + \varepsilon_{ij}^{k}$$

Where: U_{ij}^{k} = the utility of alternative *k* to individual *i in the choice situation j*

V_{ij}^{k} = the deterministic component

ε_{ij}^{k} = the random component, which is assumed to be independent and identically distributed across all individuals *i*

The multinomial logit model is the most established random utility model for several reasons. First, the MNL model has a simple, closed form specification of the choice probabilities, which enables easy implementation of predictive testing of changing market shares in response to changing levels of attributes (Louviere et al., 2000). Second, MNL quickly delivers good or acceptable models on the accepted tests of model performance in accessible and easy to use estimation software package. Third, if the independence of irrelevant alternative (IIA) property is sustained, MNL is attractive because of its unparalleled practicality. Meanwhile, some researchers argue that the IIA assumption is an undesirable restriction on behavior (Hilbe, 2006). Where one has very rich and highly disaggregated data on attributes of alternatives and agents, the model is very robust (in terms of prediction accuracy) to violations of independently and identically distributed (IID) behavioral assumptions among the alternatives in the choice set. Kropko (2008) argued that even when the IIA assumption does not hold, MNL provides more accurate coefficients than do mixed logit (MXL) and multinomial probit (MNP).

Finally, in MNL modeling, different choice experiments administered to different individuals can be analyzed together. Such a feature, when coupled with choice experiments, makes it easy to test interactions in the context of choice studies. According to Louviere and Woodworth (1983), if the MNL model can be shown to be a reasonable approximation of aggregate choice data, it would be useful in managerial applications.

2.2 3.1.2 The Random Parameter (or Mixed) Logit Model (RPL)

While the MNL is an aggregate model, which assumes that all customers have similar preferences for hotel choice attributes, the mixed logit model assumes unique preferences for each individual. This requirement for MNL can allow for easy estimation and interpretation of the results. Because of this limitation of MNL, more flexible alternative models, such as the mixed/random parameter logit (RPL), latent class, nested multinomial logit (NMNL), and multinomial probit logit (MN), have been suggested to extend the MNL model into more realistic forms. Recent literature in transportation, the environment, marketing, and agriculture includes a number of studies in discrete choice modeling that have focused on comparing results and performance across several models including MNL, RPL (or mixed), latent class, EMNL, and MNP (e.g. Birol, Karousakis, and Koundouri, 2006; Chang, Lusk, and Norwood, 2009, Greene and Hensher, 2003).

Among such models, the random parameter (mixed) logit (RPL) has been most widely applied due to several advantages: 1) complete relaxation of IIA, 2) its incorporation of different customers with different preferences, and 3) its accounting for the correlation of unobserved factors over repeated choices by each customer (Greene and Hensher, 2003; McFadden and Train, 2000). Furthermore, the RPL model is often better than MNL in terms of model fit and estimates (Birol et al., 2006). Greene and Hensher (2003) compared three discrete choice models -- MNL, RPL, and latent class models -- to identify preferences for three roads (e.g. 2-lane, 4-lane without medium, and 4-lane with median). They found that RPL outperformed MNL, showing more robust results. Most of the recent findings of discrete choice modeling show that RPL performs better than MNL in terms of model fit and performance. Thus, in this dissertation, I computed and compared the estimation results of MNL and RPL.

The MNL logit model has fixed β's (β's are the same for all respondents) and the utility of person n for the $_j$th alternative in the $_i$th choice situation is expressed as:

$U_{nij} = \beta_n \chi_{nij} + \varepsilon_{nij}$ (ε_{nij} ~ iid extreme value)

The mixed logit model has different β's for each individual and by allowing β_n to be random, the utility of the nth person for $_j$th alternative $_i$ in the mixed logit model is:

$U_{nij} = \beta_n \chi_{nij} + \varepsilon_{nij}$ (ε_{nij} ~ iid extreme value)

The mixed logit is estimated based on two approaches: MSL (maximum simulated likelihood)[3] and Bayesian (e.g. the hierarchical Bayes (HB) of Sawtooth software), which combines prior information with data on a consumer's choice. Depending on the sample size, different approaches can be used. If the sample size is large, MSL is better because the error disappears asymptomatically with an increase in size, but if the sample size is small, the HB approach is preferred (Train, 2001). In this study, the MSL approach was employed for mixed logit analysis.

2.2.3.2 Methodological Challenge in Combining Different Types of Attributes in DCA

Several researchers have called for an integration of psychological variables (e.g., expectations, word-of-mouth) or perceptions into discrete choice model formation (Ashok, Dillon, and Yuans, 2002; Ben Akiva et al., 1994; McFadden, 1986). Such an integrated model is suitable for experienced goods such as service products (e.g., resort hotels, vacation packages,

[3] "This procedure (MSL) is the same as maximum likelihood (ML) except that simulated probabilities are used in lieu of the exact probabilities" (Train, 2003, p. 240)

and restaurant meals) and entertainment products (e.g., movies or concerts) (Neelamiegham and Jain, 1999). Hospitality and tourism choices have considerable emotional or affective content (Crouch and Louviere, 2001). When consumers have limited tangible information before making a choice, they rely on anticipated emotional utility (or expectations) in choice decisions. Kwortnik (2003) argues that positive emotion plays a crucial role in choice for experiential products. However, this characteristic may make choice modeling complicated (Crouch and Louviere, 2001). Thus, a key challenge lies in how to incorporate affective attributes into stated choice modeling. In situations in which both cognitive and affective attributes are present, the differential impact on choice is expected by context and circumstances. That is, when cognitive attributes are non-diagnostic (i.e., functional attributes have the same value for two alternatives) and/or when affective attributes offer added value in addition to the value that cognitive attributes provide, affective attributes may be crucial (Brakus et al., 2008).

Researchers need to select the appropriate attributes and attribute levels when designing a choice set. A choice set refers to "the basic mechanism of conveying information to decision makers about the alternatives, attributes, and attribute levels that exist within the hypothetical scenarios of a study" (Hensher, Rose and, Grenne, 2005, p.166). When researchers model the differential effects that affective and cognitive attributes have on a consumer's hotel choices in order to identify the relative effects of affective attributes, it is important to design appropriate combinations of choice sets that consist of cognitive and affective attributes. In particular, researchers should be careful to select affective attributes that will be experienced (or imagined) by consumers in a hotel choice context. They also need to be careful about how they set the attribute levels of affect in the choice sets. One of the requirements of stated preference experiments is that the attribute levels should be well-defined (Hensher et al., 2005), which is to

say the attribute levels must have the same meaning to all respondents. The issue is how to identify the extreme ranges of the attribute levels to be used (Hensher et al., 2005). In the case of affective attributes, such as comfort, abstract or ill-defined attribute levels may create unexplained variability in choice. Researchers should make use of specific information so that consumers perceive the specific levels similarly. Thus, this study selected the appropriate levels for each attribute so that the affective attributes have the same meaning to all respondents. This dissertation incorporates affective attributes (e.g., comfortable, entertaining) and cognitive attributes into stated choice modeling and assesses the relative weights of different attributes and levels.

2.2.3.3 Design for Discrete Choice Experiments (DCEs)

2.2.3.3.1 Questionnaire Development

This section outlines the process used to generate an experimental design. Several researchers discuss this process. Hensher et al. (2005) suggest an experiment design process of eight steps: (1) refine the problem, (2) refine the stimuli (i.e., refine the list of alternatives, attributes, attribute levels), (3) consider the experimental design (e.g., type of design, reduce experiment size using a fractional factorial design), (4) generate the experimental design (e.g., optimal design, orthogonal main effects design), (5) allocate attributes to design columns, (6) generate the choice sets, (7) randomize the choice sets, and (8) construct the survey instrument. In a similar way, Verma et al. (1999) suggested that a DCA application based on choice experiments typically involves: (1) identification of attributes, (2) specification of attribute levels, (3) experimental design, (4) presentation of alternatives to respondents, and (5) estimation of the choice model.

When designing the choice experimental models, two fundamental points need to be checked. Verma, Plaschka, Hanlon, Livingston, and Kalcher (2008, p.182) argues that "when building a list of market choice drivers, one should consider the following two questions: (1) is it necessary to include an exhaustive list of all salient products and service drivers? and (2) how can product and service attributes be configured so that the critical choice drivers are identified while the choice experiment is at once realistic and small enough to be tractable?" For the generation of attributes and levels, researchers undertake a literature review, conduct qualitative research, and need to use qualitative data from in-depth interviews, focus groups, and analyses of secondary information. Regarding point 2, the key point of DCA is that they should simulate all key aspects of a real choice situation as closely as possible in order to increase the external validity of DCA (Louviere, 2006).

2.2.3.3.2 Experimental Design

Previous studies have shown that more attention should be given to the construction of the choice set since changes in the design may affect the parameter estimates and variances of the error terms (Adamowicz and Deshazo, 2006). An experimental design is a combination of attributes and levels used to construct the alternatives (profiles) in the choice set (Hoyos, 2010). Thus, appropriate attributes and levels of provision become critical aspects of any DCA since the information about respondents' preferences takes the form of choices (Hensher et al., 2005). Meanwhile, the design needs to be parsimonious because the size and complexity of choice experiments grow exponentially with increases in either the number of attributes and/or the number of levels of each attribute (Crouch and Louviere, 2004).

First, regarding attributes in a choice set, Caussade, Dios Ortuzar, Rizzi and Hensher

(2005) found that the number of attributes had a clear detrimental effect on respondents' ability to choose, leading to higher error variance. They added that the two most critical design dimensions are number of attributes and number of alternatives.

Second, levels should be relevant and plausible. Compared to the number of attributes, the number of levels had a much smaller negative effect on the ability to choose (Caussade et al., 2005). Another important aspect of levels is the attribute level balance and level range of attribute variations. The consideration of attribute level balance is important since the parameters can be estimated on the whole range of levels and the attribute level range should be wide enough that the parameter estimate will have smaller standard errors (Hoyos, 2010) because a wide level of range has a positive effect on the efficiency of the design and on the reliability of the parameter estimates (Blimer and Rose, 2005). To make the right decision about levels, follow-up qualitative interviews with customers and the pilot study should be combined.

Third, although in most studies respondents evaluate between one and 16 choice sets with the average being around eight choice sets per respondent (Louviere et al., 2000), Caussade et al. (2005) argue that stated choice experiments with 9 or 10 choice sets seem to be optimal in terms of minimizing error variance. According to Bech et al. (2010), respondents can handle up to 17 choice sets without problems, although the cognitive burden may increase with the number of choice sets. However, an important focus in experimental design is that one wants to reduce the number of choice sets to estimate the effects of interest (Street, Burgess, and Louviere, 2005) since increasing the number of choice sets leads to increases in the error term variance due to the effects of fatigue (Bradley and Daly, 1994). This is one of the reasons that researchers have mainly focused on main effect designs without considering the interaction effects between attributes, because the addition of two-way interactions significantly increases the required

choice sets in a DCE (Gao, House, and Yu, 2010).

Next, designing an efficient choice experiment involves selecting choice sets that provide maximum information along the parameters of a probabilistic choice model (Kessels, Goos, and Vandebroek, 2006). Various choice experiment designs can be considered, including orthogonal fractional factorial design, Bayesian D-optimal design, and C-optimal design in terms of the identification of estimation and prediction efficiency.

Researchers have commonly used small fractional factorial designs that allow only main effects in order to obtain the smallest number of choice sets (Viney, Lancsar, and Louviere, 2002), but an orthogonal main effect plan is limited since only the linear additive utility function can be estimated (Viney et al., 2002). Moreover, designs based on the standards of a linear model have limitations when applied to choice experiments because the models in choice experiments are usually non-linear and the variance of parameter estimates depends on the models' true parameters, not on the design itself (Gao et al., 2010).

Thus, due to their limitations, a recent trend has been the movement away from orthogonal design towards optimal or efficient designs (Hoyos, 2010). As parameter estimation is based on data obtained in DCE, not from the design, orthogonality is frequently lost in the estimation process. Thus, an orthogonal design frequently leads to non-orthogonal data (Bliemer and Rose, 2006). As mentioned before, the main difficulty in the choice design is that the probability models are non-linear in the parameters. So, a model capable of accommodating non-linearity in the utility function can have better explanatory parameters due to the characteristic of diminishing marginal utilities in the utility function. To deal with this problem, an efficient design can lead to an experimental design with smaller asymptomatic standard errors of the parameter estimates. That is, the efficient (or optimal) design may create choice situations that

minimize the standard error of the parameter estimates (Hoyos, 2010). The efficiency of the design depends on the unknown parameter vector (Kessels et al., 2006). In this case, prior information on the parameter estimates is needed for an efficient design. Regarding efficient or optimal design issues, three approaches have been introduced.

The first approach is to use a linear or utility-neutral design (zero prior parameter values) under the assumption that all alternatives are equally preferred by the respondents. Linear design has zero prior mean and prior variance (Kessels, Jones, Goos, and Vandebroek, 2008). However, the assumption of indifference among all alternatives underlying neutral design is unrealistic. As a result, the optimal design (efficient) approach has been shown to be more practical and efficient than linear (or orthogonal design) (Kessels et al., 2008).

The second approach, by Huber and Zwerina (1996), advocated the use of non-zero prior values over zero values. Assuming fixed or precisely known values for parameters, they suggested ways to generate prior parameters: the results of a pretest or experts' prior beliefs. In the literature, the optimal designs are referred to as locally optimal designs. They also argued for four characteristics as criteria for an efficient experimental design: level balance, orthogonality, minimal level overlap, and utility balance.

Recently, Sándor and Wedal (2001) introduced Bayesian design methods in choice modeling to represent uncertainty about priors. They generated a Bayesian design using D_B-optimality criterion for the multinomial logit model and found that Bayesian optimal designs outperform the locally optimal design suggested by Huber and Zwerina (1996). Kessels et al. (2008) and Bliemer and Rose (2011) expanded the work on Bayesian choice design by showing that the Bayesian optimal designs outperform utility-neutral optimal design. The most recent design literature has shown that a Bayesian optimal design for choice experiments is preferred

over orthogonal fractional factorial design. The Bayesian approach is constructed for a prior parameter distribution incorporating all prior knowledge (Kanninen, 2002; Kessels et al., 2006; Kessels et al., 2008; Vermeulen Goos, and Vandebroek, 2008). Prior information can help develop the experimental design in terms of lower standard errors and smaller sample size (Hoyos, 2010). From this perspective, efficient (or optimal) designs can produce more efficient data in that more reliable parameter estimates can be made with a lower or equal sample size (Rose and Blimer, 2009). That is, a D-efficient design needs a much smaller sample size than a random orthogonal design (Blimer and Rose, 2005).

In addition, if there is substantial uncertainty about the unknown parameters, a Bayesian D_B-optimal design outperforms the D_p-optimal design (Kessels et al., 2006; Vermeulen et al., 2008). So, using D_B-optimality criterion is the most preferred way to build an optimal choice design (Kessels et al., 2006). Although Bayesian experimental design is a fast developing area of research, its use still remains uncommon (Blimer and Rose, 2011) and "application to actual experiments still lags behind the theory" (Chaloner and Verdinelli, 1995, p.3). While the most widely used type of design for DCEs remain orthogonal fractional design, it is evident that the use of optimal (or efficient) design is growing in the literature (Bliemer and Rose, 2011).

Meanwhile, Vermeulen et al. (2008) and Goos, Vermeulen, and Vandebroek (2008) advocated the usefulness of optimal design with a no-choice option. Vermeulen et al. (2008) found that although there was no substantial gain in terms of either estimation precision or prediction accuracy from using an optimal design for the no-choice model, compared to the optimal design without a no-choice option, the inclusion of a no-choice option can lead to more accurate prediction as it reflects a more realistic choice experiment. Therefore, this dissertation uses the Bayesian D-optimal design with a no-choice option in every choice set when setting up

the choice design.

Another issue of optimal design is choice consistency (Louviere et al. 2008). Optimal design is desirable, but some other issues, such as choice consistency due to task complexity and the no-choice option need to be considered. Hence as complexity increases, consumers who have less of an ability to choose tend to make more mistakes. When designing discrete choice experiments (DCEs), researchers should consider trading a high degree of statistical efficiency for more choice consistency. Choice consistency is important since the consistency with which the consumer answers choice questions is related to experimental accuracy. Generally, the accuracy of prediction arising from a specific study depends on the robustness of the experimental design, levels, and attributes. Louviere et al. (2008) suggested that choice consistency diminishes at an increasing rate with more attributes and higher levels of statistical efficiency. Further, error variances also increase with more attributes and higher design complexity (Louviere, 2006). Statistically, efficient designs may require smaller numbers of respondents while allowing researchers to extract richer and more precise information. Also, efficient designs not only improve data quality but also lead to potential cost savings. Meanwhile, there is a negative relationship between choice consistency and task complexity. De Palma, Myers, and Papageorgiou (1994) suggest that even if consumers have identical preferences, they can differ in their abilities to choose. Therefore, this dissertation uses composite choice attributes (e.g., national brand, comfortable) instead of using a wide range of specific attributes to reduce task complexity and to improve choice consistency of respondents.

As noted above, in the D-optimal design with a no-choice option, when designing the choice sets, a no-choice option provides an alternative way of resolving difficult choices that are not available when subjects are forced to choose (Dhar and Simonson, 2003). Forcing decision

makers to select from a set of alternatives is likely to over inflate presumptive estimates (Hensher et al., 2005). When consumers are uncertain about their preferences but are forced to make a choice, they tend to select options that are easy to justify and are associated with a lower likelihood of error and regret. Thus, a no choice option strengthens the attraction effect and weakens the compromising effect (Dhar and Simonson, 2003). However, the inclusion of a no-choice option in every choice set of an experiment may have a negative impact on the information. That is, it will not provide any information about real-choice alternatives, but it may lead to more accurate predictions. In addition, labeling the alternatives may enhance the choice task degree of reality and the predictive validity of the choice model's results. However, this labeling could distort the modeling results (Huybers, 2005). Thus, this dissertation uses unlabelled, generic alternatives (i.e., Hotel A / Hotel B or Neither).

2.2.3.3.3 Survey Construction

The survey design is necessary for the choice data collection. In this process, the two questions are what type of data is to be collected and how best to collect the data (Hensher et al., 2005). First, each question in the survey should correspond to a type of data necessary for analysis. Thus, researchers should consider not only questionnaire design, but also data collection, sampling, and data analysis.

A number of sampling strategies should be considered, including simple random sample (SRS), stratified random sample, and a choice-based sample (CBS) (Henser et al., 2005). If a sample is obtained by either random or stratified random, maximum likelihood estimation may be used (Hoyos, 2010). Currently, web-based surveys are perceived as more appropriate than postal surveys due to long DCE formats (Caussade et al., 2005). Although Louviere et al. (2000)

provide guidance on the calculation of sample sizes for discrete choice experiment, “it is difficult to determine the optimal sample size for non-linear choice models because it depends on the values of the unknown parameters estimated” (Hoyos, 2010, p.1597). For SP choice data, sample size should be as large as the requirement of the robust estimation (Henser et al., 2005). If the purpose of the research is to compare groups and identify significant differences, it is recommended to include a minimum of about 200 respondents per group (Orme, 1998, 2006). In this study, I have two distinct groups based on their contests for choosing a hotel. Thus, it was necessary to have at least 400 respondents for aggregate choice modeling.

In addition, every choice respondents make is within a decision context. That is, the context of business travelers and leisure travelers are different (Hensher et al., 2005). Thus, it is necessary to ask respondents to provide information about a specific choice context (e.g., business travel or vacation travel) when asking them to assess a series of choice sets.

The final stage before actual data collection is the pilot test. A pilot test should include at least 30 respondents per group to identify priors and any potential problems that may occur during the main data collection stage. Through this process, researchers can identify the optimal number of alternatives, choice sets, and the relevance of attributes and levels. In addition, based on the results of the pilot survey, prior mean and variance are used for the final survey.

2.3 Research Objectives and Hypotheses

2.3.1 Research Objectives

Based on a thorough review of the literature on consumer choice and choice modeling, the purposes of this dissertation are to identify the relative effects of cognitive, affective, and sensory attributes on customers' hotel choices using choice modeling. Thus, this dissertation will

demonstrate the value of incorporating an experiential perspective into hotel choice modeling. Another purpose is to identify differences among the choice attributes depending on two distinct groups with different choice contexts.

The specific objectives are:

1. To address the relative impact of cognitive, affective, and sensory attributes on hotel choice
2. To examine the moderating effects of choice context on the relationship between choice attributes and hotel choice

2.3.2 Research Hypotheses

The objectives of this study are achieved by testing two hypotheses:

To test hypothesis 1, I considered four different models. Model 1 (base model) explains hotel choices based on only cognitive variables. That is, the utility of a hotel choice is a function of only cognitive attributes. Model 2 explains the same hotel choices based on cognitive and affective variables. Model 3 examines the hotel choices based on cognitive and sensory variables. Finally, model 4 (full model) examines the hotel choices based on cognitive, affective, and sensory variables. The relative explanatory power of two models is expected to improve as affective and/or sensory attributes are added to the base model. Based on this rationale, six hypotheses are proposed.

H1a: *The explanatory power of model 2, which includes both cognitive and affective attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1b: *When controlling for the cognitive attributes, affective attributes will have a significant effect on hotel choice*

H1c: *The explanatory power of model 3, which includes both cognitive and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1d*: When controlling for the cognitive attributes, sensory attributes will have a significant effect on hotel choice*

H1e: *The explanatory power of model 4 (full model), which includes cognitive, affective, and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

H1f: *When controlling for the cognitive attributes, affective and sensory attributes will have a significant effect on hotel choice*

H2: *The relative preference of cognitive, affective, and sensory attributes on hotel choice is moderated by choice context*

H2a: *In the leisure context, hotel choice will be more affected by affective and sensory attributes than by cognitive attributes*

H2b: *Leisure travelers are more influenced by price on hotel choice than are business travelers*

H2c: *In the business context, hotel choice will be more affected by cognitive attributes than by affective and sensory attributes*

H2d: *Business travelers with instrumental motives are more influenced by room quality than are leisure travelers*

CHAPTER III

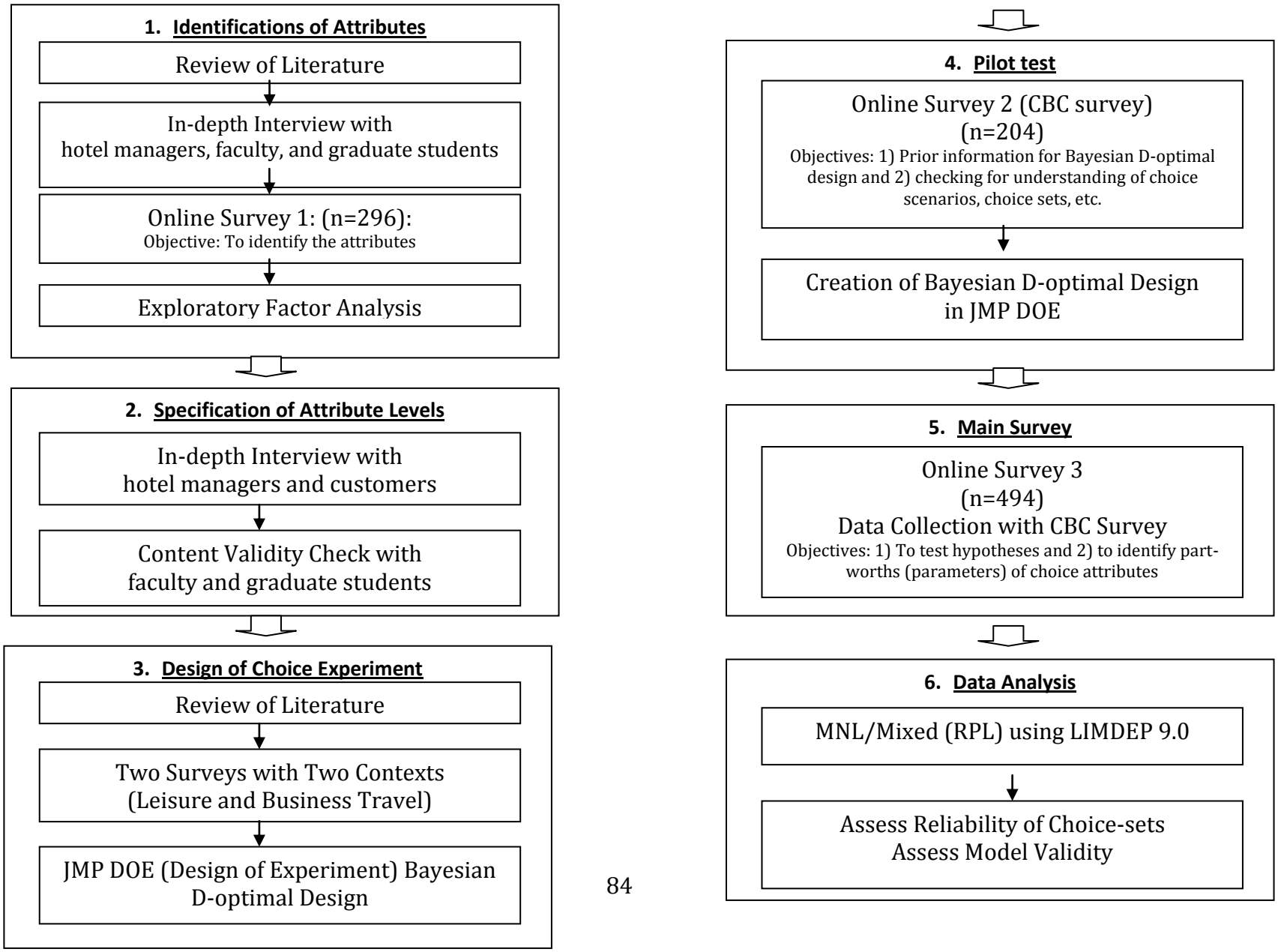
METHODOLOGY

As noted, the main purpose of this dissertation is to identify the relative effects of consumer choice attributes on hotel choice. To achieve this purpose, this dissertation had two objectives. The first objective of the study was to examine the relative impact of consumer choice attributes (H1a~f). I used Bayesian optimal design for discrete choice analysis and assessed the relative importance of each cognitive, affective, and sensory attribute based on stated choice modeling in the hotel context. The second objective was to identify the moderating effects of choice context on the relationship between choice attributes and hotel choice (H2a~d).

3.1 Hotel Choice Modeling

The choice modeling process was examined, following Verma et al.'s (1999) five steps: (1) identification of attributes, (2) specification of attribute levels, (3) experimental design, (4) presentation of alternatives and choice tasks, and (5) estimation of the choice model. Figure 3.1 shows the procedures of the choice experiment.

Figure 3.1 Procedures of Choice Experiment



3.2.1 Identification of Attributes

The first step was to identify the appropriate attributes for the hotel choice context that simultaneously assess customer preferences for cognitive, affective and sensory attributes. There were two main objectives in this step. The first objective was to identify the underlying dimensions of the consumption experience in the hotel industry. The second was to reduce task complexity by using a few reasonably orthogonal composite attributes. As noted previously, as the number of attributes and levels increases, the experimental design becomes exponentially more complicated.

3.2.1.1 Attribute Item Generation and Reduction

For attribute item generation and reduction, I conducted an extensive review of the literature and qualitative methods, specifically in-depth interviews. An exhaustive attributes pool (Appendix A) was generated based on the literature review, industry data, and other information sources. A series of interviews with hotel managers, faculty members, and graduate students in the Hospitality and Tourism management field was conducted to derive domain-specific content for each item and dimension and to refine the initial set of items. Seventeen individuals with expertise in hospitality marketing and consumer behavior research (nine Ph. D. students, four hotel managers, and four researchers) were asked to determine the importance and relevance for each of the generated items in the initial pool. After discussion with this group, the set of items was refined. Any item that at least 50 percent of judges failed to validate as appropriate for inclusion was deleted.

3.2.1.2 Attribute Item Reduction

This step involved identifying the underlying structure (composites) of the customer cognitive, affective, and sensory attributes. I conducted a field survey and used exploratory factor analysis to reduce a large set of attributes into relatively orthogonal composites by collapsing related attributes into single factors. Another purpose of the factor analysis was to identify the structure of cognitive, affective, and sensory attributes. A survey (Appendix B) was distributed via undergraduate business students at Virginia Tech (two online classes) during Thanksgiving break. Students were provided with a web-based hotel choice survey and asked to invite any non-student adults to complete the survey, in exchange for a small amount of extra course credit. Using a 7-point Likert scale, respondents were asked to answer questions about a specific hotel that they had recently visited in an effort to evaluate the extent to which these items were important cognitive, affective, and sensory attributes of hotel experiences.

To reduce unimportant items among the initial choice attributes, items that averaged less than 3.0 in the importance rating were deleted. Then, items were evaluated using exploratory factor analysis (EFA). Factor loadings were assessed and several items were deleted by low factor loading (under 0.5) or cross-loadings. The Kaiser-Meyer-Olkin (KMO) tests of sampling adequacy and the Bartless test of sphericity were conducted to determine if the data were appropriate for factor analysis. The results showed that eight composite attributes represented the three main study dimensions (cognitive, affective, and sensory attributes) well. Internal reliability analysis was conducted using Cronbach's alphas with all factors having values of 0.7 or above. Table 3.1 shows the results of the factor analysis. There are eight "composite

attributes."[4] For cognitive experience, there are four attributes: (1) price, (2) service & food quality, (3) national, recognized brand, and (4) sports facility. Affective experience has two attributes: (5) comfortable and (6) entertaining. Finally, sensory experience also consists of two attributes: (7) room quality and (8) overall atmosphere.

Table 3.1 Results of Factor Analysis of the Cognitive/Affective/Sensory Attributes (N=296)

Image factors and items	Factor Loading	Eigen Value	Variance (%)	Cronbach's α	Mean
Cognitive Attributes (KMO =0.773, Bartlett =1901.936)					
Price		4.73	33.82	0.77	
Price	0.854				5.73
Value for money	0.761				5.48
Reservation	0.628				4.65
Parking	0.624				4.92
Location	0.555				5.90
Service & food quality		2.42	17.31	0.82	
Food quality	0.802				3.97
Responsiveness of service	0.788				4.91
Variety of food	0.741				3.68
Interpersonal service	0.710				4.56
National, recognized brand		1.34	9.57	0.78	
Brand name	0.891				3.94
Loyalty program	0.828				3.60
Check-in and check-out option	0.609				4.59
Sport facility		1.15	8.20	0.76	
Swimming pool	0.842				3.62
Fitness center	0.792				3.56
Total variance extracted (%)			69.0		
Affective Attributes (KMO =0.944, Bartlett =4307.878)					
Comfortable		10.17	53.6	0.95	
Relaxed	0.857				5.72
Comfortable	0.843				5.84

[4] From this point forward, 'composite attributes' will be called 'attributes' when used in relation to the choice experiment.

Secure	0.833				5.97
Friendly	0.804				5.44
Respected	0.798				5.55
Pleased	0.792				5.58
Welcoming	0.768				5.40
Happy	0.741				5.55
Peaceful	0.731				5.40
Contented	0.693				5.23
Entertaining		2.78	14.6	0.94	
Thrilled	0.884				3.92
Privileged	0.819				4.22
Enthusiastic	0.784				4.23
Interested	0.783				4.44
Grateful	0.779				4.48
Excited	0.771				4.61
Sophisticated	0.743				4.20
Entertained	0.731				4.33
Pampered	0.672				4.37
			68.2		
Total variance extracted (%)					
Sensory Attributes (KMO =0.819, Bartlett =1190.642)					
Room quality		4.20	52.5	0.87	
Comfortable bed and pillow	0.898				6.32
Temperature	0.846				6.09
Quietness	0.788				6.00
Cleanliness	0.767				6.60
Bathroom amenities	0.662				5.85
Overall atmosphere		1.23	15.3	0.70	
Music	0.809				3.81
Overall hotel exterior	0.775				5.07
Hotel interior	0.628				5.64
Total variance extracted (%)			68.0		

3.2.2 Specification of Attribute Levels

After identifying the attributes, the next step was to determine the experimental levels of each attribute to be used for choice modeling. As mentioned previously, the most important fact is to include an exhaustive list of all salient product and service drivers (Verma, 2007). Thus, I

checked the related choice modeling literature (e.g., Verma and Plaschka, 2003) to determine the appropriate levels for each attribute. In-depth interviews with 15 customers consisting of both leisure and business travelers and two hotel managers were conducted to finalize relevant levels for each attribute. While considering customer age and gender, eight male and seven female customers from their 20s to 50s were contacted. Since choice consistency decreases with more attributes and higher levels of efficiency, the choice experiment used eight attributes based on the results of factor analysis and each level was limited to two or three levels. In particular, it is important to decide on appropriate and consistent levels for each attribute so that respondents perceive the specific levels similarly (Hensher et al., 2005). The attributes and levels are shown in Table 3.2.

After selecting the attributes and the levels for each attribute, two hotel managers, seven graduate students, and two faculty members checked the content validity and levels of these attributes for the questionnaire. In this study, I used a hotel star system as the rating criteria for hotel attributes. Although there is no international standard system, the star rating system is the most common for rating hotels as a good indicator of hotel quality and services (Katie Hennessy, 2011).[5] Also, the star rating system is used for hotel class on Internet travel websites, such as Tripadviser, Priceline, Expedia, and Hotwire. For levels of service and food quality, sport facility, affective attributes (comfortable and entertaining), room quality, and overall atmosphere, a hotel star rating system (e.g., 1 star, 3 stars, and 5 stars) was used to easily compare levels of each attribute with levels of low, medium, and high. Regarding price levels, instead of specific price information, dollar symbols ($) were used to express the price levels: 1) $ - economy price, 2)

[5] eHow.com, What Are Hotel Star Ratings, from http://www.ehow.com/facts_5453475_hotel-star-ratings.html (Accessed on April, 2011).

$$$ - mid-range price, and 3) $$$$$ - upscale price, since according to the destination, location, and season, there are large differences in hotel rates.

Table 3.2 Attributes and Levels Used in the Choice Experiment Design

Attributes	Levels	Specific Levels	Definition of levels
Cognitive experience 1. Price (per night)	3	$ $$$ $$$$$	$ Economy $$$ Mid-range $$$$$ Upscale
2. Service & Food quality	3	1 Star 3 Star 5 Star	1 Star: Basic service without on-site restaurants 3 Star: Good service with room service and dining service on-site 5 Star: High quality service hotel (including personalized service) with excellent restaurants, fine dining, bars, lounge, and room service
3. National, recognized brand	2	Yes No	Yes: Internationally recognized brand hotel No: Local independent hotel
4. Sports facilities (e.g. pool, fitness center)	2	3 Star 5 Star	3 Star: On-site sport facility, not necessarily high quality 5 Star: A high quality sport facility with the latest gym equipment and well-maintained pool
Affective experience 5. Comfortable (e.g. welcoming, friendly, relaxed, secure, etc.)	3	1 Star 3 Star 5 Star	l Star: Not comfortable 3 Star: Comfortable 5 Star: Exceptionally comfortable
6. Entertaining (e.g. excited through lounge & bar, show, etc.)	3	1Star 3Star 5 Star	1 Star: Not entertaining 3 Star: Entertaining (e.g. lounge and bar, show) 5 Star: Very entertaining (e.g. show, casino, kid program)
Sensory experience 7. Room quality (e.g. cleanliness, comfort bed, quietness, etc.)	3	1 Star 3 Star 5 Star	1 Star: Basic quality room 3 Star: A good quality room 5 Star: A high quality well-adorned room with high quality bedding and furnishings
8. Overall atmosphere (ambience) (e.g. music, interior, exterior)	3	1Star 3 Star 5 Star	1 Star: Casual ambience with basic and simple functions 3 Star: Modern, but not necessarily luxurious ambience 5 Star: The very best and most luxurious ambience

3.2.3. The Moderating Effects of Hotel Choice

The purpose of this section is to examine the moderating effects of choice context on the relationship between cognitive, affective, and sensory attributes and hotel choice. This dissertation assumes that since the two groups are differentiated according to their trip purposes, respondents will have different choice preferences. Thus, respondents were randomly divided into two groups and respondents were given different choice surveys (versions A and B) (Appendices D_1 and D_2) with different choice contexts (e.g., leisure and business travels). Specifically, there are two different surveys with distinct choice contexts in the instructions: one for the leisure travelers (A type) and the other for business travelers (B type). In other words, one group was asked to answer hotel choice sets for a leisure context (e.g., vacation leisure trip), while the other group responded to different hotel choice sets for a business context (e.g., a business trip). Thus, respondents were assigned randomly and asked to evaluate their preferences on two differently manipulated choice sets. Through this procedure, I identified the differences among choice criteria based on the two different contexts.

For moderating effects on the relationship between respondent characteristics and choice attributes, this section examines the interaction effects between the traveler type variable and cognitive, affective, and sensory attributes. In LIMDEP, to identify the moderating effects between attributes and respondent characteristics, it is necessary to include interaction effects in the model and to create new variables that represent interaction effects in the variable column. For this purpose, the interaction effects between context (leisure and business) and choice attributes variables were checked.

3.2.4. Experimental Design

The choice sets of an experimental design need to be created in an efficient way. That is, information about respondents' preferences needs to be maximized, while the standard errors are minimized. To create an effective design, the choice designer needs information about the attributes and levels. This study has two attributes with two levels and six attributes with three levels, as shown in Table 3.2.

In order to design optimal choice sets that estimate the main effects of MNL and mixed (or random parameter) logit models, this study used Bayesian D-optimal design for choice modeling in JMP 8.0, since Bayesian D-optimal design optimizes the D-error over a range of assumed parameter priors (Blimer and Rose, 2011). Based on previous studies on Bayesian experimental design (Bliemer and Rose, 2011; Kessels et al. 2006, 2008; Sándor and Wedel, 2001), I followed the Bayesian optimal design procedure for choice experiments. The prior specification is important in an experiment where the factors have known preference directions (JMP, 2009). To specify a prior parameter distribution, there are two options. First, one way to gain prior information about attributes is to conduct pilot surveys, analyze the results, and use those results to create the final survey instrument. That is, the posterior mean and variances from the pilot test are used as the prior mean and variance for the new study (Kessels et al., 2008). Another way is to use prior beliefs about the relative preferences for the attributes and its levels and to reflect this information in the prior mean. Thus, for the pilot test, I used the second method of prior mean information. To specify the prior parameter distribution, this study followed Kessels et al.'s (2006) and Sándor and Wedel (2001)'s guidance on specifying the prior parameters. For example, if there are three levels, the utilities associated with the levels are -1, 0, and 1 in increasing utility order and prior mean values were written as [-1, 0] in the prior

specification.

For design generation of the pilot survey in the optimal design of the choice experiment, the researcher needs to decide on the number of attributes that can change within a choice set (5)[6]; the number of profiles per choice set (2); the number of choice sets per survey, including one fixed hold-out alternative (9); the number of surveys (designs) (10); and the expected number of respondents per survey (1).[7] To each group of two, I added one fixed hold-out alternative that was always the same across all respondents since respondents have no experience with conjoint methods and might be uncertain about the reliability and accuracy of the market simulator. Also, these hold-out alternatives can boost confidence in this survey. Thus, the first choice set (#1) was used for fixed hold-out tasks. Eight choice sets (#2~#9) were constructed randomly and were used to estimate the choice model. After making those decisions, a design table was created. There were 18 profiles per choice alternative times nine choice sets per survey times one survey making a table of 18 (2*9*1) unique choice profiles. No-choice options were also included in each choice set. Thus, the DOE (design of experiments) choice designer created a survey like that shown in Table 3.3.

Also, "the smallest possible main effect plan may be determined by the total degrees of freedom required to estimate all main effects," (Louviere et al., 2000, p.120) and the degrees of freedom required for a design depend on the types of effects to be estimated (linear or non-linear), the labeling or unlabelling of the design, and the numbers of attributes and levels. The alternatives in this experiment were unlabeled (e.g., Hotel A, Hotel B, or Neither).

For the pilot survey (Appendices C_1 and C_2), respondents were asked to complete nine

[6] I entered 5, fewer than eight attributes to make it easier for the respondents to make a choice.
[7] For the pilot test, I used 204 convenience samples (leisure: 118 and business 86). I imported this JMP design to the Sawtooth software survey and created 10 different designs based on one respondent.

choice tasks including one hold-out choice set. The results of the pilot survey were used as prior information (i.e., prior mean and prior variance) to create a Bayesian D-optimal design for the main survey, using JMP design of experiment (DOE) and choice modeling.

The estimates were added in the prior mean and variances were added in the prior variance matrix in the main choice design. As shown in Table 3.3, based on the results of the pilot test, I created a final design using the same process above. Based on the open-ended section, there were no problems understanding the terms for the choice task, the number of choice sets (i.e., nine choice sets), completion time, etc. For the main survey, I extended the number of choice sets from nine to 16. Among the 16 choice sets, the first 15 were used to estimate the choice model and the last choice set was used as a hold-out task for checking prediction accuracy. Table 3.5 shows the Bayesian D-optimal design for choice modeling with no-choice options that was generated based on prior information. There are ten different survey designs and they were randomly assigned to the first respondent and subsequent respondents without replacement. One of the strengths of the CBC system of Sawtooth software is its ability to generate experimental designs and to import/export choice designs. In this dissertation, I developed a Bayesian optimal design for choice modeling using JMP and imported it into the CBC system for the pilot and main surveys. For this purpose, the design files should be in the .csv format, in order to be opened and saved in Excel. The traditional CBC layout format was used to import the designs.

Table 3.3 The Results of Parameter Estimates and Variances in Pilot Survey

Choice model Term	Estimates	Standard Error	Variances
Price (economy)	0.1686	0.0625	0.0039
Price (mid-range)	0.2192	0.0625	0.0039
Service (l Star)	-0.3987	0.0657	0.0043
Service (3 Star)	0.1573	0.0602	0.0036
Brand (Independent)	-0.1375	0.0377	0.0014
Sport (3 Star)	-0.0041	0.0355	0.0012
Comfortable (1 Star)	-0.5046	0.0659	0.0043
Comfortable (3 Star)	0.0048	0.0650	0.0042
Entertaining (1 Star)	-0.3016	0.0567	0.0044
Entertaining (3 Star)	0.11989	0.060	0.0036
Room (1 Star)	-0.9604	0.0657	0.0043
Room (3 Star)	0.0515	0.0587	0.0034
Atmosphere (1 Star)	-0.2451	0.0599	0.0036
Atmosphere (3 Star)	0.0329	0.0615	0.0037

Table 3.4 Bayesian D-optimal Design for Pilot Choice Modeling with No-choice Options

Choice set	Profile	Price	Service& Food	National Brand	Sport Facility	Comfortable	Entertaining	Room Quality	Overall atmosphere
1	1	$$$	1 Star	Yes	5 Star	5 Star	3 Star	1 Star	3 Star
	2	$$$$$	3 Star	Yes	3 Star	5 Star	5 Star	1 Star	3 Star
	0	No-choice option							
2	1	$$$$$	5 Star	Yes	5 Star	1 Star	1 Star	5 Star	3 Star
	2	$$$$$	3 Star	Yes	5 Star	3 Star	1 Star	3 Star	1star
	0	No-choice option							
3	1	$	1 Star	No	5 Star	3 Star	5 Star	1 Star	3 Star
	2	$	3 Star	Yes	5 Star	5 Star	1 Star	5 Star	3 Star
	0	No-choice option							
4	1	$$$$$	5 Star	No	5 Star	5 Star	5 Star	3star	1 Star
	2	$$$$$	1 Star	Yes	3 Star	5 Star	5 Star	5star	1 Star
	0	No-choice option							
5	1	$$$$$	5 Star	No	3 Star	3 Star	1 Star	5 Star	5 Star
	2	$$$	3 Star	No	5 Star	5s Star	5 Star	5 Star	5 Star
	0	No-choice option							
6	1	$$$$$	3 Star	No	3 Star	5 Star	5 Star	5 Star	5 Star
	2	$$$$$	1 Star	Yes	3 Star	1 Star	1 Star	5 Star	5 Star
	0	No-choice option							
7	1	$$$$$	5 Star	No	5 Star	3 Star	5 Star	5 Star	5 Star
	2	$$$	3 Star	Yes	5 Star	3 Star	5 Star	5 Star	3 Star
	0	No-choice option							
8	1	$$$	1 Star	Yes	3 Star	1 Star	1 Star	3 Star	5 Star
	2	$$$$$	1 Star	No	3 Star	1 Star	3 Star	5 Star	1 Star
	0	No-choice option							
9	1	$	5 Star	Yes	3 Star	3 Star	3 Star	1 Star	1 Star
	2	$$$$$	1 Star	No	3 Star	5 Star	3 Star	1 Star	5 Star
	0	No-choice option							

Table 3.5 Bayesian D-optimal Design for Main Choice Modeling with No-choice Options

Choice set	Profile	Price	Service& Food	National Brand	Sport Facility	Comfortable	Entertaining	Room Quality	Overall atmosphere
1	1	$$$	3 Star	Yes	5 Star	1 Star	3 Star	3 Star	3 Star
	2	$$$	5 Star	Yes	3 Star	1 Star	3 Star	5 Star	1 Star
	0	No-choice opt							
2	1	$$$$$	3 Star	No	5 Star	3 Star	1 Star	5 Star	3 Star
	2	$$$	1 Star	Yes	5 Star	3 Star	1 Star	5 Star	1 Star
	0	No-choice option							
3	1	$	1 Star	Yes	5 Star	3 Star	1 Star	5 Star	1 Star
	2	$$$	1 Star	No	3 Star	3 Star	5 Star	5 Star	3 Star
	0	No-choice option							
4	1	$	5 Star	Yes	5 Star	1 Star	1 Star	3 Star	3 Star
	2	$	3 Star	No	3 Star	5 Star	1 Star	3 Star	1 Star
	0	No-choice option							
5	1	$$$$$	3 Star	No	3 Star	1 Star	3 Star	1 Star	3 Star
	2	$	3 Star	Yes	3 Star	5 Star	1 Star	1 Star	3 Star
	0	No-choice option							
6	1	$$$	5 Star	Yes	5 Star	5 Star	3 Star	1 Star	5 Star
	2	$	5 Star	No	3 Star	5 Star	3 Star	5 Star	3 Star
	0	No-choice option							
7	1	$$$	1 Star	No	3 Star	3 Star	1 Star	1 Star	1 Star
	2	$$$$$	5 Star	Yes	3 Star	5 Star	5 Star	1 Star	1 Star
	0	No-choice option							
8	1	$	5 Star	No	3 Star	3 Star	5 Star	5 Star	1 Star
	2	$	1 Star	Yes	5 Star	5 Star	3 Star	5 Star	1 Star
	0	No-choice option							

Choice set	Profile	Price	Service& Food	National Brand	Sport Facility	Comfortable	Entertaining	Room Quality	Overall atmosphere
9	1	$$$	3 Star	Yes	5 Star	3 Star	1 Star	3 Star	1 Star
	2	$$$$$	5 Star	No	5 Star	1 Star	3 Star	3 Star	1 Star
	0	No-choice option							
10	1	$$$	1 Star	No	3 Star	5 Star	5 Star	5 Star	5 Star
	2	$$$$$	5 Star	Yes	5 Star	5 Star	1 Star	5 Star	5 Star
	0	No-choice option							
11	1	$$$	3 Star	No	5 Star	1 Star	3 Star	3 Star	5 Star
	2	$$$	5 Star	Yes	3 Star	1 Star	5 Star	3 Star	3 Star
	0	No-choice option							
12	1	$	3 Star	Yes	1 Star	3 Star	3 Star	3 Star	3 Star
	2	$	5 Star	No	1 Star	1 Star	5 Star	1 Star	3 Star
	0	No-choice option							
13	1	$$$$$	3 Star	No	5 Star	3 Star	5 Star	5 Star	1 Star
	2	$	3 Star	Yes	3 Star	1 Star	5 Star	3 Star	1 Star
	0	No-choice option							
14	1	$	3 Star	No	3 Star	1 Star	5 Star	1 Star	1 Star
	2	$	5 Star	Yes	5 Star	5 Star	5 Star	1 Star	3 Star
	0	No-choice option							
15	1	$	5 Star	Yes	5 Star	1 Star	1 Star	3 Star	1 Star
	2	$$$	5 Star	Yes	5 Star	3 Star	5 Star	1 Star	3 Star
	0	No-choice option							
16	1	$$$	3 Star	Yes	3 Star	5 Star	3 Star	1 Star	5 Star
	2	$	5 Star	Yes	5 Star	3 Star	1 Star	1 Star	5 Star
	0	No-choice option							

3.2.5 Presentation of Alternatives and Choice Task

3.2.5.1 Online Choice Survey

The choice based conjoint survey was administered via online survey. An Internet survey has advantages of ease of use, immediacy, time saving (response and data-entry time), and response rate, compared to a mail survey. First, if the web is used for a conjoint survey, look and presentation of questions can be controlled, while presenting one task at a time to respondents (Foytik, 1999). Second, researchers easily change the content for minor revisions while providing a survey with visually appealing pictures. Third, respondents can access the survey immediately and thus we can collect the data very quickly, compared to a mail survey. Finally, conjoint web surveys have higher response rates, about 25 to 50 percent higher than mail surveys (Foytik, 1999). On the other hand, as respondents need to access to a computer and the Internet, the survey is limited to a portion of the population. Thus, it may comprise the generalizability of the results.

A few companies in the United State provide web software for choice based surveys. I used the SSI web survey provided by Sawtooth software[8] to create choice based conjoint (CBC) surveys. I focused on creating a survey design that was clear and easy to follow and checked the process format through the pilot test conducted prior to the main survey. Two different survey links (leisure and business context) were created for distribution. Several graduate students in the Hospitality and Tourism department filled out the survey and commented on it before distributing it to other students. By clicking on the link, respondents were directed to the survey

[8] Sawtooth Software is a specialized company that has developed marketing research software for discrete choice model and conjoint analysis since it released its first conjoint analysis software system, called ACA (Adaptive Conjoint Analysis) in 1985 (Orme, 2009). It is able to generate conjoint survey questionnaires through a user friendly format.

on the SSI web. Seven hundred thirty respondents accessed the SSI web and completed the pilot and main surveys.

3.2.5.2 The Pilot Survey

After finalizing the list of attributes and their levels, I created a design table with 18 choice profiles. Each scenario listed two sets of attributes labeled Hotel A and Hotel B, with a neither option added for respondents who did not want either A or B. Respondents were asked to choose the scenario they most preferred. Tables 3.3 and 3.5 reflect a sample choice experiment question for leisure and business contexts. To enhance the realism of the task, a full-profile approach was used to present the choice sets.

The final stage before actual data collection was to pilot test the questionnaire. The primary objective of the pilot survey was to test the content and survey process (Hensher et al., 2005). Through this process, I checked the questionnaire in general, respondents' understanding of the choice scenarios and specific context instructions, and the computer-based survey's length and process, as well as generating prior information for the main survey design. Previous studies suggest that at least 30 respondents per survey can provide precise parameter estimates (Hall, Kenny, and King, 2002). Orme (2006) recommended the following sample size for aggregate–level choice based conjoint modeling.

$nta/c \geq 500$

n = number of respondents

t = number of tasks (ex. pilot test - 9 choice sets)

a = number of alternatives per task (not including the none option) (2 alternatives)

c = number of analysis cells (c is equal to the largest number of levels for any one attribute – 3 levels)

Based on Orme's rule of thumb, I needed at least 84 (83.33) respondents for each group. Thus, I pilot-tested the survey with 204 (leisure: 118 and business: 86) conveniently selected potential hotel customers to ensure comprehension of the task in regard to instructions, wording, and explanations, as well as to ensure reliable data collection methods. A survey was distributed via undergraduate business students at Virginia Tech (online class) at the beginning of April 2011. Students were instructed to invite any non-student adults to complete it in exchange for a small amount of extra course credit. Respondents were provided with a choice-based conjoint survey through survey links on Internet. Through the process of the pilot test, I identified the optimum number of choice scenarios that respondents could complete effectively without compromising survey reliability and average task completion time. Most of all, the results of the pilot survey were used as prior information (i.e., prior mean and prior variance) for the main experimental design.

3.2.5.3. The Main Survey

Very few changes were made to the main survey as a result of the pilot survey except for the number of choice sets and the basic requirements for respondents (leisure and business hotel experience within 12 months). For the main survey, adults, 18 years and older, who stayed at a hotel at least once in the last year were surveyed. The required sample size for choice surveys depends on the number of choice sets presented to a respondent and the complexity of the experimental design (Blimer and Rose, 2005). As there were two distinct groups for the choice modeling, this study needed at least 400 respondents (200 per group).[9] The target sample size

[9] Orme (1998, 2006) recommends at least 300 respondents for choice based conjoint (called CBC). If the purpose of the research is to compare two groups, it is necessary to have about 200 per group.

was 500 based on the two groups and the complexity of the design. I used a stratified random sampling method so that the results of the analysis could be readily transferable to a larger population of interest. I used a professional panel company to obtain reliable, potential respondents, scattered across the United States. In order to screen for an appropriate sample, the screening question used was, "Have you traveled to any destination and stayed in a hotel more than one night for leisure (or business) in the past 12 months?" In this dissertation, business travelers were limited to individual travelers who choose their own hotels for sales trips or corporate meetings because they give hotels higher perception ratings as compared to business travelers who do not choose a specific hotel (Lewis, 1984b). Hotels for the latter business travelers (e.g., conference or convention, etc.) are sometimes selected by intermediaries such as travel agents, ground operators, or secretaries, or are due to contracts with firms.

The complete questionnaire consisted of three sections. The first section included some general questions about hotel experience including those about a recent hotel stay, the frequency of leisure (or business) travel within 12 months, the purpose of the recent stay, the type of hotel visited, previous experience at this brand (or type) of hotel, frequency at this hotel, and the likelihood of travel (leisure or business) within the next 12 months. The second section began with instructions about the hypothetical choice context of each survey version, followed by 16 hotel choice sets. Based on the two different contexts (leisure and business), there were two different surveys (Appendices D_1 and D_2). The last section of the survey contained questions to collect respondents' demographic information, such as gender, age, marital status, area of residence (zip-code), race, educational background, and income, including an open-ended section at the end of the survey.

At the beginning of the choice section, I presented the choice scenarios with instructions

about the decision context in which respondents were to consider each of the choice sets. For the leisure context, I chose Orlando because it ranks first among the most visited US destinations and overnight leisure destination (Smith Travel Research and Orlando/Orange County Convention Visitors and Bureau, Inc., 2010)[10]. Chicago was chosen as the destination for the business choice context. According to the latest biennial survey and analysis of Business Travel & Costs (9th edition) published by Runzheimer International, with its central location, Chicago is the most popular US business travel destination, followed by New York (2nd), and Atlanta (3rd). It also ranks 3rd among the top 10 most visited cities (Forbes' Top 10 most-visited U.S. cities, 2011)[11]. Thus, the two different choice contexts are shown in Tables 3.2 and 3.4.

[10] Orlando Travel & Tourism Update from http://cityoforlando.net/citycleark/citycouncil/workship_files/presentations/2010-09-13_cvb.pdf (Accessed on January 2011)

[11] http://www.consumertraveler.com/today/forbes-lists-top-10-most-visited-u-s-cities/(Accessed on January 2011)

Figure 3.2 Instructions for the Leisure Travelers

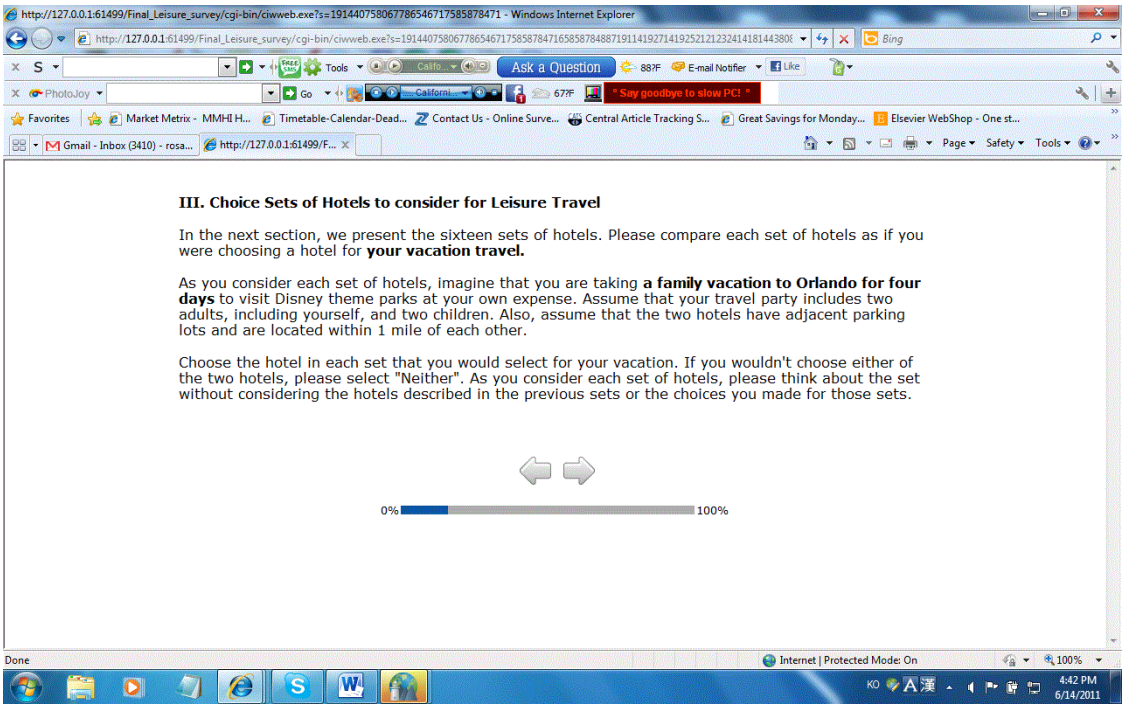


Figure 3.3 A Sample Choice Experiment Question

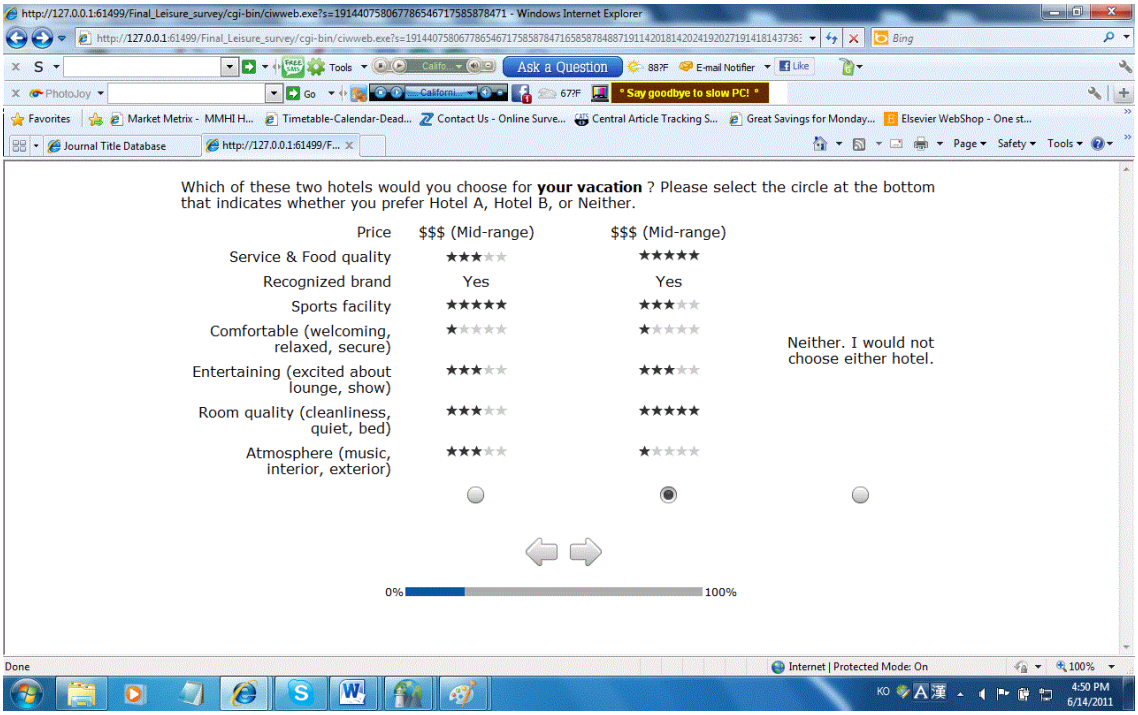


Figure 3.4 Instructions for the Business Travelers

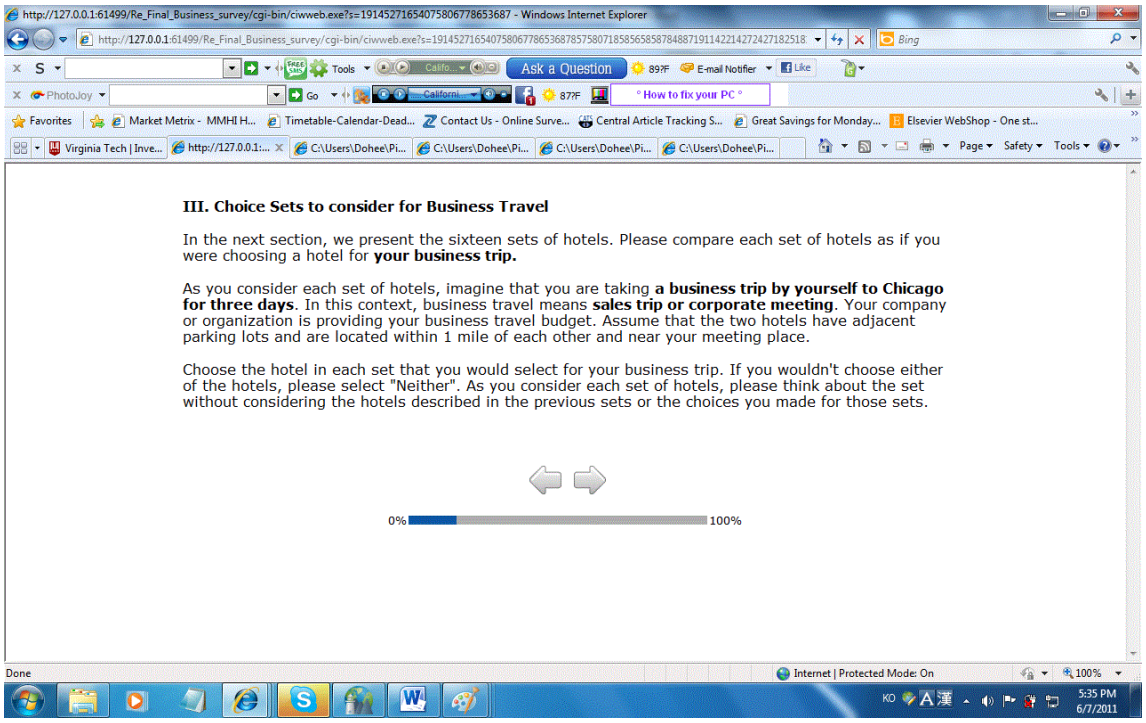
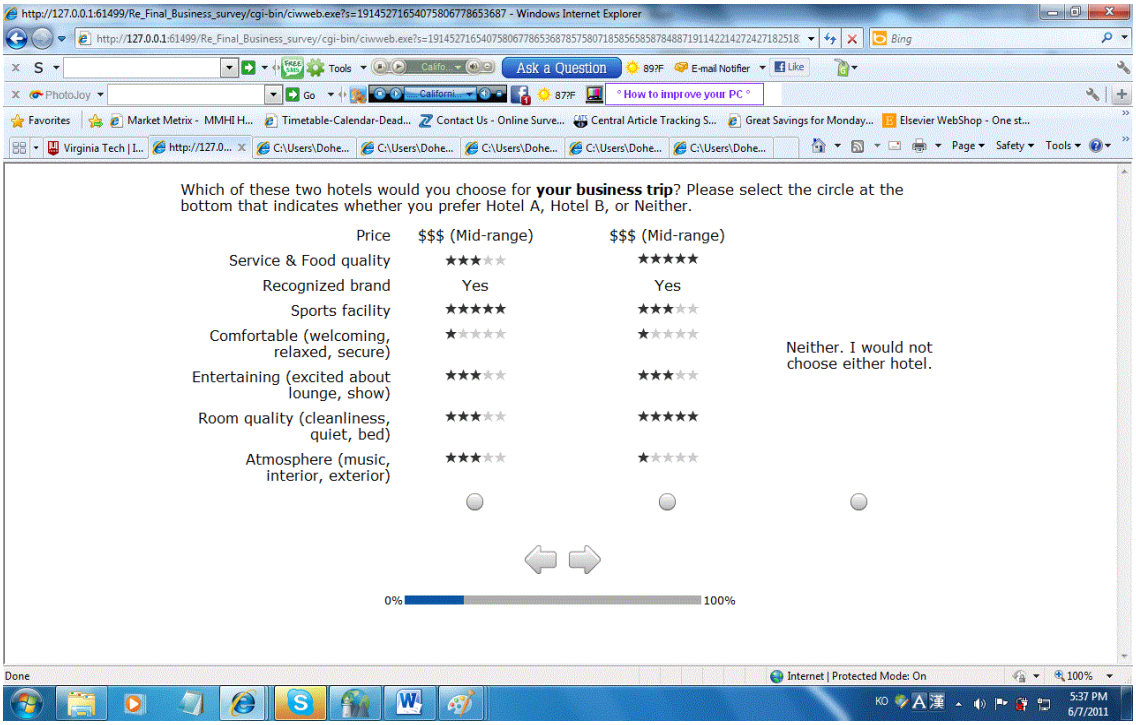


Figure 3.5 A Sample Choice Experiment Question



3.2.6 Estimation of the Choice Model

The last step of the study was to examine how cognitive, affective, and sensory attributes predict consumer hotel choice using a multinomial logit model (MNL) and random parameter logit (RPL) model. Thus, I conducted discrete choice modeling based on cognitive, sensory, and affective attributes. This dissertation uses LIMDEP 9.0[12] to estimate multinomial logit (MNL) and RPL choice models for all respondents. Maximum likelihood procedures were used to estimate the parameters β (known as part-worths) of the choice model, in which respondents choose Hotel A, Hotel B, or neither. Using models derived from random utility theory, the probable relationship between utility and choice can be measured statistically, by translating individual differences into predicting a general type of behavior. Consumers' utilities are shown to predict hotel choice beyond the effects of the cognitive attributes.

Choice modeling is sufficiently robust to predict behavioral outcomes on the basis of stated choice. The likelihood ratio (LR) test is a statistical test used to compare a set of nested models[13] (Ben-Akiva and Lerman, 1985; Hoyos, 2010; Louviere et al., 2000). "The LR test serves the same function for maximum likelihood estimation that *F* test serves for least square" in regression (Ben-Akiva and Lerman, 1985, p.28). The test is based on the likelihood ratio, which is used to compute the probability of the difference as -2LL[14] and be compared to decide whether the null model can be rejected in favor of alternative model. It can also test the contribution of particular subsets of variables, that is, the explanatory power of independent variables. The likelihood ratio function is "a useful criterion for assessing overall goodness of fit

[12] LIMDEP is an econometric software that provides the function for estimation, model simulation, and analysis of multinomial choice data.

[13] This means that the restricted model (the null model) must be a constrained version of the full model (alternative model). The restricted model must be a subset of the full model.

[14] -2LL is obtained by multiplying the difference in the log-likelihoods of two models by -2.

when the maximum likelihood estimation method is used to estimate parameters of the MNL model" (Louviere et al., 2000, p.53). "Goodness of fit of estimated models is measured by a statistic called the likelihood ratio index" (LRI) (Hoyos, 2010, p.1598). That is, the LRI is used to measure how well the estimated model fits the data in the DCE. The likelihood ratio index has values from 0 (very low level of model prediction) to 1 (model perfectly predicts choice). Thus, LRI is defined as:

$$\rho^2 = 1 - \frac{L(\beta)}{L(0)} \qquad \text{where } 0 \leq \rho^2 \leq 1$$

Where L(β) is the value of the log-likelihood function at the estimated parameters

L(0) is its value when all the parameters are set equal to zero

The ρ^2 (called rho-squared as a type of pseudo R^2 or the Pseudo Coefficient of Determination) represents the overall fit of the model as a standard used to describe probabilities of the discrete choice model. The ρ^2 value in discrete choice models is similar to the R^2 in regression analysis (Birol et al., 2006) and values of ρ^2 between 0.2 and 0.4 are considered to have excellent model fits (Louviere et al., 2000). The larger the ρ^2, the larger the proportion of log-likelihood explained by the estimated model. Given comparisons of the models' overall fit and the significance of the LR test, I can identify the relative impact of choice attributes on hotel choice.

First, the likelihood ratio test is a statistical test used to compare two nested models and to test the relative explanatory power of variables. Thus, hypotheses 1a~c were tested using the likelihood ratio test. To measure the magnitude of goodness-of-fit of the MNL and RPL model, p^2 value and the adjusted p^2 value of each model were checked. In particular, given the different number of parameters estimated, an adjusted ρ^2 (ρ^2_{adj}) is a better objective criterion for comparing

alternative models of the same data because ρ^2 can only increase with additional explanatory variables. The ρ^2_{adj} statistic is the ρ^2 statistic adjusted for the number of parameters estimated and is given below. In general, the larger ρ^2_{adj}, the greater the explanatory power of the model.

$$\bar{\rho}^2 = 1-[\frac{L(\beta)-K}{L(0)}]$$

Where L (β) is the value of the log-likelihood function at the estimated parameters

L (0) is its value when all the parameters are set equal to zero

K is the number of parameters in model

Specifically, to test hypothesis 1a, I compared the log-likelihoods for the base model and model 2 and calculated the likelihod ratio as -2 In L[15] (Appendix E). This can be compared to the critical value for two degrees of freedom (i.e., the difference of estimated parameters: 6 minus 4) using a chi-square test at the 0.05 significance level. Then, if the calculated value is greater than the critical value, I can reject the null hypothesis that there is no statistically significant difference and conclude that model 2 (the more complex model) is better than the base model to explain hotel choice. Also, the adjusted ρ^2 values between the base model and model 2 were compared in order to check the difference of the model's overall goodness-of-fit. In addition, in hypothesis 1b, by checking the utility parameters and statistical significance of utility parameters, I tested the hypothesis so that when controlling cogntive attributes, the affective attributes had a significant effect on hotel choice.

To test hypothesis 1c, I compared the log-likelihoods for the base model and model 3 and compared the critical value and calculated value, using a chi-square test. Through this

[15] In L is the difference between two log-likelihoods.

procedure, it showed that the explanatory power of model 3 was greater than that of the base model. Then, the adjusted ρ^2 values for the base model and model 3 were compared for model fit.

Finally, to test hypothesis 1e, I compared the log-likelihoods for the base model and model 4. Similarly, it showed that the explanatory power of model 4 was greater than that of the base model. In addition, the adjusted ρ^2 values of the base model and model 4 were compared to identify the difference of the model fit.

In sum, on the basis of the likelihood ratio test, models 2, 3, and 4 provided a better fit than the base model. Using the adjusted p^2 values, the magnitude of the goodness of fit in each MNL model and RPL model was checked.

Hypothesis 2 is designed to test the moderating effects of choice context. In other words, hypothesis 2 is to test the interactions between travelers' type with choice attributes on hotel choice. So, model 5 is a MNL (or RPL) model with interactions between a dummy variable for traveler type (leisure travelers coded as 1 and business travelers coded as 0) and choice attributes. The results of model 5 show how the choice context influences the relative preferences of cognitive, affective, and sensory attributes on hotel choice.

3.2 Reliability and Validity of the Discrete Choice Model

3.2.1. Reliability

Overall, reliability refers to the ability of a measurement to generate consistent results in repeated studies. In a choice model, reliability means that with repeated measures of a choice, we attain similar results up to a sampling error (Hensher et al., 2005). The most common measure for internal consistency is Cronbach's alpha test (criterion $\alpha = .7$) (Hair et al., 2006). Two

methods for testing the reliability of conjoint analysis are test-retest reliability and spilt-half reliability. In the case that researchers have many choice sets, the same fixed choice sets are placed at the beginning and end of the questionnaire (e.g. 1st choice set and 16th choice set). Another method for testing reliability is the spilt-half method, which compares part-worth estimations between the first paired choice sets and the last choice sets and checks the correlation coefficient using Cronbach's alpha test. Thus, for testing reliability in this dissertation, I used the second spilt-half reliability method and constructed two different data sets: one that consists of the first eight choice sets (1~8 choice sets) and the other that consists of the last eight choice sets (9~16 choice sets).

Reliability was assessed by comparing the different part-worth of the two data sets using LIMDEP. With these two sets of part-worth, a bivariate correlation analysis was conducted between them. The Cronbach's alpha (α) using SPSS was 0.960, indicating highly reliable part-worth estimation of choice sets. Therefore, with two repeated studies, consistent results were obtained, indicating that the choice sets used are highly reliable.

3.2.2. Validity

Validity consists of two aspects: Internal validity and external validity. Internal validity refers to the degree to which the measures used (e.g., independent variables) assess the intended conclusion (e.g., dependent variable(s)). In this dissertation, the choice attributes influence the probability of hotel choice. Thus, multiple measurements, such as mixed logit, or nested logit, can be employed to improve the validity of the choice model results. In this dissertation, I compared the results of MNL and mixed (or random parameter) logit in terms of the goodness of fit of the model and parameter estimation. For external validity, in choice modeling, as revealed

preference (RP) data represent the real life choices, it is desirable to collect SP data and RP data and compare them within a single study in terms of external validity.[16] One of the challenges, however, is how researchers can consistently provide questions across both data sets (Hensher et al., 2005). Thus, in this dissertation, I focused on the internal validity of the choice model with two different procedures (i.e., MNL and RPL).

[16] The comparison between SP and RP may address externality validity, that is, whether SP models can capture the underlying preferences revealed in RP data (Louviere et al., 2000).

CHAPTER IV

ANALYSIS AND RESULTS

This chapter presents the data analysis, hypothesis testing, and related results. The first section of the chapter describes the sampling procedure and sample characteristics that include the demographic profile and recent hotel experience of leisure and business travelers. The second section discusses the data setup and analysis. The third section explains the results of the choice surveys and includes the estimation of part-worth (parameters) and hypothesis testing. The fourth section discusses the choice model validity by comparing the MNL and RPL results and the prediction performance based on the root mean square error (RMSE). The last section concludes with a summary of results.

4.1. The Sample

The data were collected during one week in April 2011. An online panel (i.e., Zoompanel) company provided the sample. This online panel is a consumer panel that reflects the U.S. population. The sample for this study was pulled from pre-profiled travellers among the online consumer panel's members. Each panel list is profiled for hundreds of demographic, lifestyle, occupational, and geographic attributes. Recruiting is done through online advertising. A survey link was sent with the invitation.

The target sample of this study was travelers who have spent at least one night in a hotel for leisure or business purposes in the last 12 months. A leisure traveler is one who travels for leisure purposes, such as vacation, recreation, and/or family events. A business traveler is limited to individuals who travel for business purposes, such as sales calls or corporate meetings, and choose their hotels by themselves, not by a company’s contract. Respondents were randomly

selected using an extensive database provided by the online panel company. Panel members had already agreed to be contacted to participate in survey research. The web survey was administered by the online panel company to its panel members. The panel company sent an introductory email to the panel in search of customers who stayed in a hotel for leisure or business purposes. The online panel company administered the survey to 10,200 members and 909 people accessed the web survey (475 leisure respondents and 434 business respondents accessed the web survey). Before starting the survey, a screening question was provided that asked respondents if they had stayed in a hotel at least one night for leisure or business travel within the previous 12 months. Those who answered "yes" could proceed and finish the choice set questions, but those who answered "no" were terminated from the survey. There were 510 respondents who completed the survey, resulting in a 20 percent response rate. In total, 259 usable leisure surveys and 251 usable business surveys were collected. Among the 510 useable surveys, 16 had bad data (e.g. respondents who checked all the neither options or did not have choice design information) were deleted from the analysis. Data from a total of 494 surveys were used for MNL and mixed logit (or RPL) estimation. The final data consisted of 249 leisure travelers and 245 business travelers for the two different context surveys.

4.1.1 Demographic Profile

Table 4.1 provides a description of the sample characteristics including gender, age, marital status, race, education, and household income. The demographic table, table 4.1, shows the comparisons between the general population and leisure and business travelers. In general, the respondents are Caucasian with a high degree of education (more than a college degree). Of the 494 respondents, 260 (52.6 percent) were men. The number of male respondents is very

similar in the leisure and business contexts. One hundred thirty two men (53 percent) responded to the leisure survey and 128 (52.2 percent) to the business context. The age distribution is: under 30 (19.1 percent), 30-39 years old (27.4 percent), 40-49 years old (16.8 percent), 50-59 years old (17.4 percent), and 60 or older (19.3 percent). In terms of marital status, 30.4 percent of respondents were single, 56.9 percent married, and 12.5 percent widowed, separated, or divorced. In terms of race, 80 percent of respondents were Caucasian/white, followed by Asians (7.9 percent), African Americans (5.3 percent), and Hispanics (3.4 percent). Regarding education, 70 percent of the respondents had a college degree or higher. Specifically, 40 percent of the respondents had a college degree, while about 30 percent had a graduate degree, and 22.7 percent had some college. In particular, in the business context, 36.7 percent of respondents had a graduate degree, implying a high level of educational level. Finally, in terms of household income, 21.7 percent of respondents earned an income between $50,000 and $74,999. The second, third, and fourth income groups were fairly evenly represented fairly even: $100,000~$149,999 (18.2 percent), $75,000~$99,999 (17.8 percent), and $25,000~$49,999 (16.6 percent). Seven percent of respondents did not answer the income question.

Table 4.1 Demographic Profile for Respondents

Demographic Category		All travelers		Leisure travelers		Business travelers	
		Number	%	Number	%	Number	%
Gender	Male	260	52.6	132	53.0	128	52.2
	Female	232	47.0	117	47.0	115	46.9
	No response	2	0.4			2	0.8
	Total	494	100.0	249	100.0	245	100.0
Age	Under 30	94	19.1	57	22.9	37	15.1
	30-39	135	27.4	66	26.5	69	28.2
	40-49	83	16.8	35	14.1	48	19.6
	50-59	86	17.4	44	17.7	42	17.1
	60 and older	95	19.3	47	18.9	48	19.6
	No response	1	0.2	-	-	1	0.4
	Total	494	100.0	249	100.0	245	100.0
Marital Status	Single	150	30.4	77	30.9	73	29.8
	Married	281	56.9	137	55.0	144	58.8
	Widowed/Separated/ Divorced	62	12.5	35	14.0	27	10.9
	No response	1	0.2	-	-	1	0.4
	Total	494	100.0	249	100.0	245	100.0
Race	African American	26	5.3	16	6.4	10	4.1
	Asian	39	7.9	16	6.4	23	9.4
	Hispanic	17	3.4	7	2.8	10	4.1
	Caucasian/White	400	81.0	204	81.9	196	80.0
	Native American	3	0.6	2	0.8	1	0.4
	Other	7	1.4	4	1.6	3	1.2
	No response	2	0.4	-	-	2	0.8
	Total	494	100.0	249	100.0	245	100.0
Education Level	Less than high school	1	0.2	1	0.4	-	-
	High school	31	6.3	21	8.4	10	4.1
	Some college	112	22.7	72	28.9	40	16.3
	College degree	199	40.3	97	39.9	102	41.6
	Graduate degree	147	29.8	57	22.9	90	36.7
	No response	4	1.6	1	0.4	3	1.2
	Total	494	100.0	249	100.0	245	100.0
Household Income	$0 - $24,999	27	5.5	20	8.0	7	2.9
	$25,000 - $49,999	82	16.6	45	18.1	37	15.1
	$50,000 - $74,999	107	21.7	52	20.9	55	22.4
	$75,000 - $99,999	88	17.8	46	18.5	42	17.1
	$100,000 - $149,999	90	18.2	40	16.1	50	20.4
	$150,000 - $199,999	31	6.3	14	5.6	17	6.9
	$200,000 - $249,999	13	2.6	4	1.6	9	3.7
	$250,000 - $299,999	6	1.2	1	0.4	5	2.0
	$300,000 or more	14	2.8	6	2.4	8	3.3
	No response	36	7.3	21	8.4	15	6.1
	Total	494	100.0	249	100.0	245	100.0

4.1.2 Recent Hotel Experience

In this dissertation, only respondents who had stayed in a hotel at least one night for leisure or business travel within the past 12 months were invited to complete the survey.

First, most of the leisure travelers (71.9 percent) had taken a leisure travel that required a hotel stay between one and four times in the last 12 months, while 28.1 percent had taken leisure trips over five times within the last 12 months. The main purpose of the most recent hotel stay was vacation and leisure (71.1 percent). The second most popular purpose of leisure travel was family events (e.g. wedding, funeral, etc.) and third was business and convention (11.6 percent). The type of hotel that respondents stayed in during their most recent stay was upper-upscale (31.3 percent), followed by mid-scale hotel (28.5 percent), independent hotel (17.3 percent), upscale (11.7 percent), economy (7.6 percent), and luxury /resort hotel (1.6 percent). Regarding mid-scale hotels, the usage by leisure travelers (28.5 percent) is higher than that of business travelers (20.0 percent).

Most respondents (71.5 percent) answered "yes' as to whether they had previous experience with this brand (or type). Of respondents who answered 'yes' to this question, their frequency of staying at the brand (or type) of this hotel (or type) was one time (23.4 percent), followed by 3-4 times (18.5 percent), two times (15.7 percent), and 5-7 times (11.6 percent). This means that most respondents were familiar with a specific brand and the frequency of staying at this brand was relatively high. Finally, regarding the likelihood of leisure travel in the next 12 months, most leisure respondents (70.3 percent) are very likely to take a leisure trip, while 23.7 percent planned a medium level (4-5 levels) of travel, and only a few respondents were not likely to take any leisure trips. This implies that most leisure respondents plan to take another trip in the next 12 months.

Meanwhile, all business travelers had taken at least one business trip within the last 12 months: once (29.4 percent), twice (17.6 percent), 3-4 times (20.4 percent), 5-7 times (13.9 percent), and 8 or more (17.6 percent). The main purpose of the most recent hotel stay was business and convention (65.7 percent), next was vacation and leisure (29.4 percent). For business travelers, the type of hotel that they stayed in during their most recent stay was upper-upscale (43.7 percent), mid-range (20 percent), upscale (15.5 percent), independent (11.8 percent), economy (2.9 percent), and luxury/resort hotels (2.9 percent). For business travelers, the proportion of the upper-upscale (e.g. Hyatt, Marriott, Hilton, Westin) (43.7 percent) was higher than that (31.3 percent) of leisure travelers. The proportion of frequent visits to a specific brand in the business context (77.1 percent) was a little higher than among leisure travelers (71.5 percent), implying that business travelers are more familiar with hotel brands. The frequency of the hotel brand (or type) was 3-4 times (21.2 percent), one time (17.6 percent), two times (15.9 percent), 5-7 times (14.7 percent), and 8 or more (12.2 percent). Finally, in terms of the likelihood of business travel in the next 12 months, most respondents (67.8 percent) would likely take a business trip and only 21.2 percent of them showed a medium level of likelihood.

Table 4.2 Recent Hotel Experience of Respondents

Characteristics	All travelers		Leisure travelers		Business travelers	
	Number	%	Number	%	Number	%
The frequency of leisure or business travel in the last 12 months						
One time	139	28.1	67	26.9	72	29.4
Two times	94	19.0	51	20.5	43	17.6
3-4 times	111	22.5	61	24.5	50	20.4
5-7 times	65	13.2	31	12.4	34	13.9
8 or more	82	16.6	39	15.7	43	17.6
No response	3	0.6			3	1.2
Total	494	100.0	249	100.0	245	100.0
The purpose of recent stay in a hotel						
Vacation or leisure	249	50.4	177	71.1	72	29.4
Business or convention	190	38.5	29	11.6	161	65.7
Family events (e.g. wedding, funeral, etc.)	42	8.5	33	13.3	9	3.7
Other	13	2.6	10	4.0	3	1.2
Total	494	100.0	249	100.0	245	100.0
Type of hotel stayed in during the most recent stay						
Economy	26	5.3	19	7.6	7	2.9
Midscale	120	24.3	71	28.5	49	20.0
Upscale	67	13.6	29	11.7	38	15.5
Upper-upscale	185	37.4	78	31.3	107	43.7
Luxury/Resort	11	2.2	4	1.6	7	2.9
Independent hotel	72	14.6	43	17.3	29	11.8
Others (n/a, not sure, don’t remember, etc.)	13	2.6	5	2.0	8	3.3
Total	494	100.0	249	100.0	245	100.0
The previous experience at this brand (or type)	127	25.7	71	28.5	56	22.9
No	367	74.3	178	71.5	189	77.1
Yes	494	100.0	249	100.0	245	100.0
Total						
The frequency of this hotel brand (or type)						
One time	101	20.4	58	23.3	43	17.6
Two times	78	15.8	39	15.7	39	15.9
3-4 times	98	19.8	46	18.5	52	21.2
5-7 times	65	13.2	29	11.6	36	14.7
8 or more	42	8.5	12	4.8	30	12.2
No response	110	22.3	65	26.1	45	18.4
Total	494	100.0	249	100.0	245	100.0
The likelihood of leisure or business travel in the next 12 months						
1-3 (not likely)	42	8.5	15	6.0	27	11.0
4-5 (medium)	111	22.5	59	23.7	52	21.2
6-7 (very likely)	341	69.0	175	70.3	166	67.8
Total	494	100.0	249	100.0	245	100.0

4.2 Data Setup and Analysis

In most statistical packages, each row of data represents an individual observation, but LIMDEP requires the assignment of several rows of data to represent a single respondent (Hensher et al., 2005). Thus, I made a data set for LIMDEP analysis. In this dissertation, I used a choice based conjoint (CBC) web survey for data collection and exported all data in the SSI web into the Excel format. The data set shows that all of a respondent's answers were placed in a single row. As there were 16 choice sets per respondent, I created a full data set that included 32 rows per respondent. Once I created the data set based on participant responses and corresponding choice information (cho. file),[17] I transferred the Excel data into the LIMDEP format via STAT/Transfer. Also, regarding the choice responses (Hotel A: 1, Hotel B: 2, and Neither: 0), I used the SAS program to change all respondents' choice variables into a dummy coding format that consists of 1 and 0. The response 1 indicates that an alternative was selected, while 0 indicates that it was not chosen.

For the second hypothesis testing, it was necessary to create interaction terms for the context variables with the choice attributes in order for the model to be correctly specified. If the test included any socio-demographic variables and context variables, new variables to create interaction effects had to be generated (Hensher et al., 2005). In LIMDEP, I created eight new variables for interaction effects using the CREATE command: pritext (price*context), sertext (service*context), bratext (brand* context), spotext(sport*context), comtext (comfortable* context), enttext (enterta*context), rootext (room* context), and atmtext(atmos*context). As the

[17] The choice file shows the design combination for all respondents. Cho files were provided by Sawtooth software's Web program.

names of variables are limited to eight characters in LIMDEP, I mixed three letters of the attributes and four letters of "text".

To test the hypotheses and to identify the relative importance of the attribute on hotel choice, all data were analyzed using MNL and a random parameter (or mixed) logit in LIMDEP 9.0[18]. For the hypothesis testing, the log-likelihood (LL) ratio tests (LR) were used to determine whether the overall model was statistically significant. I compared the LL function of the choice model at convergence to the LL function of some other base model. Model 1 with cognitive attributes was used as the base model to show how other estimated models (models 2, 3, and 4) improved over the base model. If an estimated model does not improve the LL function in comparison to the base model, it means that the additional parameters estimation did not add to the predictive capability of the base model. Statistical Package for the Social Sciences (SPSS) was used for the demographic information and recent hotel experience data analysis.

Hensher et al. (2005) argues that the use of an alternative-specific constant (ASC)[19] makes no sense in the case of an unlabeled choice experiment. In this dissertation, using Hotel A and Hotel B did not convey any meaning to the respondent on what the alternative presented. Thus, I assume that there are no unobserved influences that are systematically different for alternative A and B. Thus, this dissertation did not include ASC in the model.

[18] According to Chang and Lusk (2011), they compared three ecometric softwares, SAS, STATA, and LIMDEP (NLOGIT) based on the mixed logit as one of discrete choice modeling options and LIMDEP was the best-performing software of the three in terms of estimation accuracy.

[19] "ASC is a parameter for a particular alternative used to represent the role of unobserved sources of utility" (Hensher et al., 2005, p.695).

4.3 Analysis Results

4.3.1 The MNL Result of Pilot Survey

As noted earlier, I conducted a pilot survey to check the overall choice survey process, to test respondents' understanding of the choice context, and to create prior information for the main survey design. The estimates values of the pilot results were added to the prior mean and variances were added to the prior variance matrix for the main choice design (see Table 3.3). The results of the pilot survey showed an excellent model fit (ρ^2=0.28). Based on part-worths (or parameter coefficients), room quality was the most important attribute, which has a greater importance of 0.943. A comfortable feeling was the second most important attribute (0.439), followed by service and food quality (0.327), national brand (0.314), price (-0.294), entertaining (0.213), and overall atmosphere (0.179). Only sports facility did not have a statistically significant effect on hotel choice.

The overall model fit of leisure travelers (ρ^2=0.30)[20] was higher than that of business travelers (ρ^2=0.27). Generally, for the leisure context, the relative importance of choice attributes showed a similar pattern when compared with the aggregated sample; room quality was the most important factor. National brand was the second most important factor, implying that respondents prefer well-known brands rather than unfamiliar and independent hotels. Next, comfortable, service and food quality, and price were recognized as important. In terms of entertaining and overall atmosphere, leisure travelers had higher expectations on these attributes than business travelers. For business context, room quality was still the most important factor, followed by comfortable, service and food quality, price, brand, entertaining, and atmosphere.

[20] A pseudo R^2 of 0.3 is an excellent fit for a discrete choice model. Pseudo R^2 values between the range of 0.3 and 0.4 can be regarded as an R^2 of between 0.6 and 0.8 for liner model (Hensher et al., 2005).

Table 4.3 The MNL Results of Pilot Survey

Attributes	Aggregated sample Estimates	Standard errors	Leisure travelers Estimates	Standard errors	Business travelers Estimates	Standard errors
Price	-0.2947***	0.049	-0.301***	0.065	-0.282***	0.077
Service & Food quality	0.3277***	0.057	0.336***	0.076	0.320***	0.087
National brand	0.3152***	0.074	0.385***	0.098	0.213*	0.113
Sports facility	0.0833 NS	0.069	0.055 NS	0.092	0.137 NS	0.106
Comfortable	0.4397***	0.052	0.366***	0.069	0.552***	0.083
Entertaining	0.2133***	0.048	0.247***	0.063	0.169**	0.073
Room	0.9436***	0.056	0.986***	0.074	0.896***	0.085
Overall atmosphere	0.1788***	0.049	0.218***	0.065	0.129*	0.074
Model fit						
Log likelihood function	-697		-398		-294	
Number of observations	1409		820		589	
Pseudo R^2 (ρ^2)	0.28		0.30		0.27	
Number of parameters	8		8		8	
Number of respondents	204		118		86	

***= significant at the 0.01; **=significant at the 0.05; *=significant at the 0.1

4.3.2. The MNL Results of Aggregated Sample, Leisure and Business Contexts

Based on the results of the pilot survey, the main survey was adjusted and conducted. The relative importance of the eight attributes on hotel choice was estimated with part-worths (coefficients) (see Table 4.4). For the aggregate MNL, room quality (0.797) was the most important attribute. Comfortable (0.431) and price (-0.425) were the second and third most important attributes in hotel choice, followed by service and food quality (0.320); national, well-known brand (0.159); overall atmosphere (0.146); and entertaining (0.103). Only sport facility did not influence hotel choice. Among the significant variables, only the price estimates were negative, implying that when the price for a hotel increases, the probability of choosing that hotel will decrease. Overall, there were few differences between the main and pilot surveys. For both leisure and business customers choosing a hotel, room quality was still the most critical factor, but respondents also had high expectations for service and food quality, national brand, and price, as well as feeling comfortable, being entertained, and having a sensory atmosphere.

The model fit was measured by -2LL, AIC (Akaike information criterion), BIC (Bayesian information criterion) values, as well as pseudo R^2 (ρ^2).[21] The leisure model was better than the business model in terms of log-likelihood function, which was measured by LL (leisure: -1564 versus business -1772). Similarly, in terms of pseudo R^2 (ρ^2), while the model fit of the aggregated sample was 0.17, the model fit of the leisure context (0.21) was higher than that of the business context (0.15).[22] Among the three models, the leisure context model represented the best model fit measure over 0.20, which was only slightly better than that of the aggregated model.

Table 4.4 The MNL Results of Aggregated Sample, Leisure, and Business Travelers

Attributes	Aggregated sample		Leisure travelers		Business travelers	
	Estimates	Standard errors	Estimates	Standard errors	Estimates	Standard errors
Price	-0.425***	0.027	-0.531***	0.403	-0.336***	0.035
Service & Food quality	0.320***	0.321	0.295***	0.046	0.347***	0.043
Well-known brand	0.159***	0.159	0.171***	0.052	0.149***	0.049
Sports facility	-0.016 NS	-0.016	0.024 NS	0.052	-0.052 NS	0.049
Comfortable	0.431***	0.431	0.509***	0.042	0.362***	0.037
Entertaining	0.103***	0.103	0.094**	0.037	0.115***	0.035
Room	0.797***	0.797	0.874***	0.044	0.740***	0.041
Overall atmosphere	0.146***	0.146	0.064 NS	0.041	0.218***	0.039
Model fit						
Log likelihood function	-3358		-1564		-1772	
Number of observations	5920		2876		3044	
Pseudo R^2 (ρ^2)	0.17		0.21		0.15	
AIC	6732		3144		3560	
BIC	6765		3172		3588	
Number of respondents	494		249		245	

***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level /AIC (Akaike information criterion) is -2 (LL –P); BIC (Bayesian information criterion) is –2LL+ P * ln (N), where p is the number of parameters, N is the number of individuals in the sample, and LL is the log-likelihood of the model.

[21] Pseudo R-squared (ρ^2) is not an absolute fit measure for the model, but overall, researchers report this in the empirical results (Hilbe, 2006).

[22] The smaller the -2LL, *AIC, and BIC*, the better the model fit.

4.3.3. Hypothesis Testing

4.3.3.1 Hypothesis 1

Hypothesis 1 is intended to examine how cognitive, affective, and sensory attributes predict consumer hotel choice. To test hypothesis 1, I used the LR test. As the log-likelihood ratio (LR) test is a typical test that can be used to compare models with different variables, base model 1 and models 2, 3, and 4 were compared. If there were large differences in log-likelihoods, there was evidence to support preferring the more complex model to the base model. Through this procedure, the relative importance of choice attributes on hotel choice was identified. Tables 4.6 ~ 4.8 represent the test results of each sub-hypothesis. For the baseline model, I used MNL to test hypotheses, and simultaneously used a random parameter logit model to validate results. If respondents have consistent preferences, MNL can better explain a discrete choice model. If preference heterogeneity exists among respondents, however, RPL may fit the model better. The random parameters provide preference information through the standard deviation of the parameters, but, it is necessary to select more than one random parameter among variables. In RPL, parameters that are not chosen as random parameters are regarded as fixed parameters. Although all parameters can be treated as random, "it might be problematic to establish the model with a full set of random parameters" (Hensher et al., 2005, p.612). Thus, assuming that all parameters are random, based on statistically significant parameter estimates for standard deviation for random parameters at the 0.05 level (i.e., when there is preference heterogeneity among respondents), random parameters were chosen. Using this procedure, random parameters in the discrete choice model were selected for each model.

***H1a**: The explanatory power of model 2, which includes both cognitive and affective*

attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes

First, in hypothesis 1a (see Table 4.6), the log-likelihoods for the base model and model 2 in MNL were compared and the likelihood ratio calculated as -2LL. The obtained value, -2LL (-2*(LL(M1) - LL(M2)), exceeded the critical Chi-square critical value (5.99) with two degrees of freedom (2 = 6-4) at the 0.05 significance level. The calculation was:

-2LL = -2 * ((-3946)-(-3719)) = 454 > 5.99

Second, in RPL, the same procedure as used for an LR test was applied. The -2LL values based on an LL for models 1 and 2 were calculated and compared with the Chi-square critical value (7.82) with three degrees of freedom at the 0.05 level. The calculation was:

-2LL = -2* ((-3834-(-3716)) = 236 > 7.82

Thus, I can reject the null hypothesis that model 2 is no better than the base comparison model. It implies that the explanatory power of model 2 is greater than that of the base model. Thus, hypothesis 1a, using MNL and RPL, was supported. The results indicate that model 2 with cognitive and affective attributes (comfortable and entertaining) explains hotel choice better than the base model, which only has cognitive attributes.

***H1b**: When controlling for the cognitive attributes, affective attributes will have a significant effect on hotel choice*

Next, based on the coefficient values (parameters), I tested hypothesis 1b. Regarding parameters (part-worth) that influence the hotel choice probability, Table 4.6 shows that when controlling for cognitive attributes, two affective attributes (comfortable at the 0.01 level and entertaining at the 0.05 level) in the MNL model had significant effects on hotel choice. In the RPL model, when controlling for cognitive attributes, two affective attributes (comfortable at the 0.01 level and entertaining at the 0.1 level) also significantly influenced hotel choice. Overall, the model fit of RPL with the magnitude of the coefficient value was better than the MNL model fit (model 2: 0.07 of MNL versus 0.09 of RPL). However, in terms of statistical significance, MNL outperformed RPL.

H1c: *The explanatory power of model 3, which includes both cognitive and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

Table 4.7 shows the model comparison between models 1 and 3 for hypothesis 1c. First, based on MNL, using the same procedure, the -2LL calculated value was compared to a Chi-square statistic (5.99) with two degrees of freedom at the 0.05 significance level. The calculation was:

-2LL= -2* (-3946-(-3488)) = 916 > 5.99

Second, in terms of RPL, -2LL was calculated and compared with a critical value (7.82) with three degrees of freedom at the 0.05 level.

-2LL = -2 * (-3834-(-3398)) = 872 > 7.82

Thus, the explanatory power of model 3 was greater than that of the base model. Hypothesis 1c was also supported based on MNL and RPL. The result indicates that model 3 with cognitive and sensory attributes explains hotel choice better than model 1 with only cognitive attributes.

***H1d**: When controlling for the cognitive attributes, sensory attributes will have a significant effect on hotel choice*

For hypothesis 1d, coefficient values were checked as shown in Table 4.7. When controlling for cognitive attributes, two sensory attributes, room quality and overall atmosphere, had significant effects on hotel choice in both the MNL and RPL models. Based on MNL, room quality was the most important factor to influence hotel choice, followed by price, service and food quality, atmosphere, and national brand. In terms of RPL, national brand was not statistically significant, implying that RPL represents a more strict procedure in terms of statistical significance, while allowing preference heterogeneity across respondents.

***H1e**: The explanatory power of model 4 (full model), which includes cognitive, affective, and sensory attributes on hotel choice, will be greater than that of the base model, which includes only cognitive attributes*

In hypothesis 1e (see Table 4.8), based on MNL, the -2LL value of the base model and model 4 was calculated and compared to a Chi-square's critical value (9.49) with four degrees of freedom at the 0.05 level:

$-2LL = -2\ (-3946-(-3358)) = 1176 > 9.49$

Based on RPL, -2LL was calculated and compared to a critical value (12.59) with six degrees of freedom (6=12-6):

-2LL = -2 (-3934-(-3327)) =1214 > 12.59

Thus, based on MNL and RPL, hypothesis 1e was supported. The explanatory power of model 4 was greater than that of the base model. It indicates that model 4 with cognitive, affective, and sensory attributes explained and predicted hotel choice better than model 1 with only cognitive attributes.

H1f*: When controlling for the cognitive attributes, affective and sensory attributes will have a significant effect on hotel choice*

For hypothesis 1f, like models 2 and 3, Table 4.8 indicates that when controlling for cognitive attributes, all affective and sensory attributes significantly influenced the choice probability of a hotel in both the MNL and RPL models. Thus, hypothesis 1f was supported. In both models, room quality was the most influential factor, but, in MNL, comfortable and price were the second and third factors. Meanwhile, in RPL, price was the second most important factor as a random parameter and comfortable was the third factor. When preference heterogeneity of price exists among a population and was considered a random parameter, the magnitude of relative importance tends to be higher than when that factor was treated as a fixed parameter.

Table 4.5 Summary Table of the -2LL Results

Hypothesis	Model	-2LL	Critical value for the Chi-square tests[a]	Degree of freedom
H1a	MNL	454	5.99	2
	RPL	236	7.82	3
H1c	MNL	916	5.99	2
	RPL	872	7.82	3
H1e	MNL	1176	9.49	4
	RPL	1214	12.59	6
H2	MNL	42	15.51	8
	RPL	50	18.31	10

[a] significant level at the 0.05 level

Table 4.6 Comparison between Model 1 and Model 2

Attributes	MNL		RPL			
	Model 1 Coefficient	Model 2 Coefficient	Model 1 Coefficient	Standard deviation of Para.	Model 2 Coefficient	Standard deviation
Price	-0.225*** (0.022)[a]	-0.294*** (0.024)	-5.991***(0.928)	31.462***(0.317)	-2.149***(0.411)	7.065***(1.212)[b]
Service & Food	0.311***(0.027)	0.307***(0.028)	2.545***(0.080)	-	1.064***(0.286)	-
National brand	0.203*** (0.031)	0.156*** (0.033)	3.319***(0.910)	5.126***(0.444)	0.451 NS (0.309)	4.054 ** (1.694)
Sport facility	0.071** (0.030)	-0.008 NS (0.033)	-0.103 NS (0.827)	-	-0.249 NS (0.245)	-
Comfortable		0.434***(0.026)			2.149***(0.472)	0.154 NS (0.354)
Entertaining		0.049**(0.024)			0.5011 * (0.268)	
Log likelihood function	-3946	-3791	-3834		-3716	
N. of observations	5920	5920	5920		5920	
AIC	7900	7594	7680		7450	
BIC	7917	7619	7750		7488	
Adj ρ^2	0.03	0.07	0.07		0.09	
N of parameters	4	6	6		9	
N. of respondents	494	494	494		494	

[a] [b] parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

Table 4.7 Comparison between Model 1 and Model 3

Attributes	MNL		RPL			
	Model 1 Coefficient	Model 3 Coefficient	Model 1 Coefficient	Standard deviation of Par.	Model 3 Coefficient	Standard deviation
Price	-0.225*** (0.022)[a]	-0.348***(0.027)	-5.991***(0.928)	31.462***(0.317)	-2.074***(0.545)	5.364***(1.171)[b]
Service & Food	0.311***(0.027)	0.3078***(0.030)	2.545***(0.080)	-	1.105***(0.213)	-
National brand	0.203*** (0.031)	0.176***(0.034)	3.319***(0.910)	5.126***(0.444)	0.027 [NS](0.158)	0.616 [**] (0.014)
Sport facility	0.071** (0.030)	0.042 [NS] (0.033)	-0.103 [NS](0.827)	-	-0.047 [NS] (0.260)	-
Room quality		0.789***(0.030)			4.453***(1.154)	4.935***(1.621)
Atmosphere		0.197***(0.027)			0.998 [***](0.213)	-
Log likelihood function	-3946	-3488	-3834		-3398	
N. of observations	5920	59920	5920		5920	
AIC	7900	6988	7680		6814	
BIC	7917	7013	7705		6852	
Adj ρ^2	0.03	0.14	0.07		0.17	
N of parameters	4	6	6		9	
N. of respondents	494	494	494		494	

[a b]parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

Table 4.8 Model Comparison between Model 1 and Model 4

Attributes	MNL		RPL			
	Model 1 Coefficient	Model 4 Coefficient	Model 1 Coefficient	Standard deviation	Model 4 Coefficient	Standard deviation
Price	-0.225*** (0.022)[a]	-0.425***(0.027)	-5.991***(0.928)	31.462***(0.317)	-0.922***(0.136)	1.374***(0.259) [b]
Service & Food	0.311***(0.027)	0.320***(0.031)	2.545***(0.080)	-	0.545***(0.072)	0.468 [NS](0.348)
National brand	0.203*** (0.031)	0.159***(0.035)	3.319***(0.910)	5.126***(0.444)	0.127*(0.071)	-
Sport facility	0.071** (0.030)	-0.016 [NS](0.036)	-0.103 [NS](0.827)	-	-0.009 [NS] (0.074)	-
Comfortable		0.431***(0.028)			0.679***(0.080)	-
Entertaining		0.103***(0.026)			0.191***(0.058)	1.235***(0.343)
Room quality		0.797***(0.031)			1.658***(0.216)	1.489***(0.275)
Atmosphere		0.146***(0.029)			0.273***(0.062)	
Log likelihood function	-3946	-3358	-3834		-3327	
N. of observations	5920	5920	5920		5920	
AIC	7900	6732	7680		6678	
BIC	7917	6765	7705		6728	
Adj ρ^2	0.03	0.17	0.07		0.19	
N of parameters	4	8	6		12	
N. of respondents	494	494	494		494	

[a] [b]parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

In addition, based on MNL, models 2 and 4 were compared in terms of log-likelihoods (Table 4.9); -2LL (-2*-433=866) was greater than the critical value (5.99) at the 0.05 level, implying that the explanatory power of model 4 was greater than that of model 2 with cognitive attributes. Based on RPL, -2LL (778) was greater than a critical value (7.82) with three degrees of freedom at the 0.05 level. This result proves the absolute importance of sensory attributes on hotel choice.

Also, the log-likelihoods of models 3 and 4 were also calculated as -2LL (-2*-130=260) in MNL and the -2LL value was greater than the critical value (5.99) with two degrees of freedom at the 0.05 level (Table 4.10). In RPL, -2LL (142) was greater than a critical value (7.82) with three degrees of freedom at the 0.05 level. Thus, model 4 with cognitive, affective, and sensory attributes explains more than model 3 with cognitive and sensory attributes. This procedure proves the absolute importance of affective attributes in hotel choice. As models 2 and 3 were not nested, the two models could not be compared using an LR test.[23] However, the difference between models 2 and 4 (-2LL:866 in MNL and 778 in RPL) was greater than the difference between models 3 and 4 (-2LL: 260 in MNL and 142 in RPL), which implies the relative importance of sensory attributes on hotel choice was larger than that of affective attributes. Basically, the fundamental product of a hotel is the "room" itself and customers recognize "room quality" as a critical factor in choosing a hotel.

[23] In the case of non-nested models, we cannot employ the likelihood ratio (LR) test to compare two models (Ashok et al., 2002). The adjusted likelihood ratio index, ${}_{adj}\rho^2$, *however,* can be used to test non-nested hypotheses of discrete choice models (Ben-Akiva and Lerman, 1985; Hoyos, 2010).

Table 4.9 Comparison between Model 2 and Model 4

Attributes	MNL		RPL			
	Model 2 Coefficient	Model 4 Coefficient	Model 2 Coefficient	Standard deviation	Model 4 Coefficient	Standard deviation
Price	-0.294*** (0.024)[a]	-0.425***(0.027)	-2.149***(0.411)	7.065***(1.212)	-0.922***(0.136)	1.374***(0.259) [b]
Service & Food	0.307***(0.028)	0.320***(0.031)	1.064***(0.286)	-	0.545***(0.072)	0.468 [NS](0.348)
National brand	0.156*** (0.033)	0.159***(0.035)	0.451 [NS](0.309)	4.054 [**](1.694)	0.127*(0.071)	-
Sport facility	-0.008 [NS] (0.033)	-0.016 [NS](0.036)	-0.249 [NS] (0.245)	-	-0.009 [NS] (0.074)	-
Comfortable	0.434***(0.026)	0.431***(0.028)	2.149***(0.472)	0.154 [NS] (0.354)	0.679***(0.080)	-
Entertaining	0.049**(0.024)	0.103***(0.026)	0.5011 [*] (0.268)		0.191***(0.058)	1.235***(0.343)
Room quality		0.797***(0.031)			1.658***(0.216)	1.489***(0.275)
Atmosphere		0.146***(0.029)			0.273***(0.062)	
Log likelihood function	-3791	-3358	-3716		-3327	
N. of observations	5920	5920	5920		5920	
AIC	7954	6732	7450		6678	
BIC	7619	6765	7488		6728	
Adj ρ^2	0.07	0.17	0.09		0.19	
N of parameters	6	8	9		12	
N. of respondents	494	494	494		494	

[a] [b]parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

Table 4.10 Comparison between Model 3 and Model 4

Attributes	MNL		RPL			
	Model 3 Coefficient	Model 4 Coefficient	Model 3 Coefficient	Standard deviation	Model 4 Coefficient	Standard deviation
Price	-0.348***(0.027)[a]	-0.425***(0.027)	-2.074***(0.545)	5.364***(1.171)	-0.922***(0.136)	1.374***(0.259)[b]
Service & Food	0.308***(0.030)	0.320***(0.031)	1.105***(0.213)	-	0.545***(0.072)	0.468 [NS](0.348)
National brand	0.176***(0.034)	0.159***(0.035)	0.027 [NS](0.158)	0.616 [**] (0.014)	0.127*(0.071)	-
Sport facility	0.042 [NS] (0.033)	-0.016 [NS](0.036)	-0.047 [NS] (0.260)	-	-0.009 [NS] (0.074)	-
Comfortable	0.789***(0.030)	0.431***(0.028)	4.453***(1.154)	4.935***(1.621)	0.679***(0.080)	-
Entertaining	0.197***(0.027)	0.103***(0.026)	0.998 [***](0.213)	-	0.191***(0.058)	1.235***(0.343)
Room quality		0.797***(0.031)			1.658***(0.216)	1.489***(0.275)
Atmosphere		0.146***(0.029)			0.273***(0.062)	
Log likelihood function	-3488	-3358	-3398		-3327	
N. of observations	5920	5920	5920		5920	
AIC	6988	6732	6814		6678	
BIC	7013	6765	6852		6728	
Adj ρ^2	0.14	0.17	0.17		0.19	
N of parameters	6	8	9		12	
N. of respondents	494	494	494		494	

[a] [b]parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

In sum, the results show that models 2, 3, and 4 were better than the base model in predicting hotel choice because differences between the log-likelihoods of the compared models were greater than the critical value at the 0.05 level. I can reject the null hypothesis that there is no difference between the base model and the compared models. Also, when controlling for cognitive attributes, based on MNL and RPL, affective attributes in model 2, sensory attributes in model 3, and affective and sensory attributes in model 4 were all significant in hotel choice. Thus, taken together, all six hypotheses of H1 (1a, 1b, 1c, 1d, 1e, and 1f) were fully supported based on the MNL and RPL results. The results imply that when customers choose a hotel, they not only consider cognitive attributes (i.e., price, service and food quality, brand name), but also sensory attributes (in particular, room quality), and affective attributes (i.e., comfortable) together with overall atmosphere (ambience) and entertaining factors.

In addition, based on the MNL model, the model fit indicates that as expected, the base model has the lowest model fit (0.03). While model 2 has low model fit (0.07), model 3 with cognitive and sensory attributes (0.14) and model 4 (full model with eight attributes) (0.17) have reasonable model fits although they did not represent excellent model fits.[24] Given the different number of parameters, an adjusted ρ^2 was used to compare the base model and the compared models (2, 3, and 4). Overall, the RPL model fit was better than the MNL model fit for all models (1, 2, 3, and 4) as shown in Table 4.11.

[24] Usually, if MaFadden pseudo R^2 (ρ^2) has values from 0.2 and 0.4, the discrete choice model represents an excellent model fit.

Table 4.11 Model Fit Comparison between MNL and RPL

Model	MNL		RPL	
	Adj ρ^2	N. of parameters	*Adj* ρ^2	N. of parameters
Model 1 (cog.att.)	0.03	4	0.07	6
Model 2 (cog.+affect. att.)	0.07	6	0.09	9
Model 3 (cog.+sensory att.)	0.14	6	0.17	9
Model 4 (cog+ affect + sensory att.)	0.17	8	0.19	12

4.3.3.2 Hypothesis 2

As I noted in the data setup and analysis, for hypothesis 2 testing, I created eight new variables using the "Create" command in LIMDEP. The eight new variables and previous eight variables were included in the independent variables for the choice model and 16 parameters were used for choice estimation based on MNL and RPL. Using the LR test for hypothesis 1, I tested the interaction effects of the choice context with choice attributes.

H2: *The relative preference of cognitive, affective, and sensory attributes on hotel choice is moderated by choice context*

The results show that among eight variables, four interaction effects (price*context, atmosphere*context, comfortable*context, and room*context) had significant effects on hotel choice. The other four interaction effects did not have statistically significant effects, indicating that there were no significant differences for those attributes between leisure and business travelers in hotel choice.

H2a*: In the leisure context, hotel choice will be more affected by affective and sensory attributes than by cognitive attributes*

***H2b**: Leisure travelers are more influenced by price on hotel choice than are business travelers*

Specifically (see Table 4.12), leisure travelers were influenced by an overall sensory atmosphere more than by cognitive attributes (e.g., brand, sport facility). In terms of affective attributes, the comfortable variable with customer context was significant but did not support the hypothesized direction of the relationship. Also, they are more price-sensitive compared to business travelers because they pay their own travel expenses, while business travelers take business trips on their companies' budgets and accordingly tend to be less price sensitive. Thus, hypothesis 2a was partially supported in sensory attribute (atmosphere*context) and 2b was supported based on price (price*context). The result was pretty much the same in the MNL and RPL models, but, in RPL, the coefficient values of price*context and atmosphere*context were greater than those of MNL.

***H2c:** In the business context is instrumental, hotel choice will be more affected by cognitive attributes than by affective and sensory attributes*

***H2d:** Business travelers are more influenced by room quality than are leisure travelers*

Second, contrary to my expectations, compared to leisure travelers, business travelers put more emphasis on a comfortable feeling. That is, the comfortable factor did not support the hypothesized direction of the relationship. It implies that they prefer a hotel that provides a quality room and comfortable feelings such as safe, relaxed, and friendly. Based on this finding, "the affective comfortable feeling" was focused to be a critical factor in choosing a hotel, in particular, among business travelers. Business travelers were influenced more by the affective

comfortable attribute than the cognitive attributes in both the MNL and RPL models. Thus, hypothesis 2c was not supported. Regarding hypothesis 2d, based on MNL, business travelers were more influenced by room quality than leisure travelers. The possible explanation is that room quality critically influences business travelers' condition and work efficiency for the next day. Also, as leisure travelers focus more on price, the relative importance of room quality is reduced in hotel choice. While room quality with context was significant in the MNL model, it was not significant in the RPL model. Thus, in sum, hypothesis 2c was not supported and hypothesis 2d was supported based only on MNL.

Meanwhile, the LR test used for hypothesis 1 was employed to the compare model fits of models 4 and 5 with interaction effects. Comparing the -2LL of [42=(-2*(-3358)-(-3337))] to the Chi-square critical value of 15.51 with eight degrees of freedom at the 0.05 level, the LR test was greater than the critical value of model 5. I can conclude that model 5 with interaction effects improved the LL a little over model 4. Although model 5 explained the choice model a little better than model 4 (0.17), the difference of model fit was relatively small (the LRI of Model 4: 0.17 and the LRI of Model 5: 0.18). In terms of the AIC index, the AIC for model 5 (6706) represented better model fit, compared to that of model 4 (6732), when considering eight more parameters. Given the number of increased parameters, the model fit improved a little.

Based on RPL's log-likelihood test, -2LL (50) was greater than a critical value (18.31) with ten degrees of freedom at the 0.05 level. Thus, model 5 with interaction effects was better than model 4 with eight choice attributes. Similarly, if we consider 22 parameters in the estimation model, the AIC value (6648) was somewhat smaller than that of model 4 (6678) in that a smaller AIC represents a better model. In reality, the model fit did improve a little.

Table 4.12 Comparison between Model 4 and Model 5

Attributes	MNL		RPL			
	Model 4 Coefficient	Model 5 Coefficient	Model 4 Coefficient	Standard deviation	Model 5 Coefficient	Standard deviation[b]
Price	-0.425***(0.027)[a]	-0.726***(0.916)	-0.922***(0.136)	1.374***(0.259)	-1.752***(0.464)	1.942***(0.680) [b]
Service & Food	0.320***(0.031)	0.243***(0.102)	0.545***(0.072)	0.468 [NS](0.348)	0.334 [NS] (0.221)	-
National brand	0.159***(0.035)	0.191*(0.114)	0.127*(0.071)	-	0.083 [NS] (0.250)	-
Sport facility	-0.016 [NS](0.036)	0.100 [NS](0.117)	-0.009 [NS] (0.074)	-	0.372 [NS] (0.308)	-
Comfortable	0.431***(0.028)	0.656***(0.093)	0.679***(0.080)	-	1.221***(0.291)	-
Entertaining	0.103***(0.026)	0.074 [NS](0.084)	0.191***(0.058)	1.235***(0.343)	0.112 [NS] (0.202)	1.112***(0.395)
Room quality	0.797***(0.031)	1.001***(0.102)	1.658***(0.216)	1.489***(0.275)	2.247***(0.486)	1.518***(0.423)
Atmosphere	0.146***(0.029)	-0.090 [NS](0.094)	0.273***(0.062)		-0.240 [NS] (0.225)	0.854**(0.399)
Interaction effects						-
Price*context		0.195***(0.055)			0.402**(0.161)	-
Service* context		0.052 [NS](0.063)			0.225 [NS] (0.181)	-
Brand* context		-0.021[NS](0.071)			0.060 [NS] (0.179)	0.647 [NS](0.449)
Sport* context		-0.076[NS](0.072)			-0.192 [NS] (0.177)	-
Comfort* context		-0.147***(0.056)			-0.245*(0.146)	-
Enterta* context		0.020 [NS] (0.052)			0.096 [NS] (0.132)	-
Room* context		-0.134**(0.063)			-0.171 [NS] (0.159)	-
Atmos* context		0.154***(0.101)			0.417**(0.187)	0.668**(0.327)
Log likelihood function	-3358	-3337	-3327		-3302	
N. of observations	5920	5920	5920		5920	
AIC	6732	6706	6678		6648	
Adj ρ^2	0.17	0.18	0.19		0.20	
N of parameters	8	16	12		22	
N. of respondents	494	494	494		494	

[a] [b]parentheses: standard errors. ***=significant at the 0.01 level, **=significant at the 0.05 level, *=significant at the 0.1 level

4.4 Choice Model Validity by Comparison of MNL and RPL Results

The MNL should always be the starting point for empirical analysis; it provides major input about the data and parameter signs and significance (Hensher et al., 2005). However, because of its unrealistic restrictive assumptions, researchers have created more flexible specifications, such as mixed (random parameter) logit, nested logit, and latent class models. Among several logit models, random parameter logit, which relaxes MNL assumptions and considers individual heterogeneity across sample populations, has been used widely in the transport, environmental, agricultural, and marketing fields. Thus, I used an RPL model to check model validity with MNL as the base model.

First, an LR test was conducted to identify whether the RPL model is better than the MNL model. To compare the two procedures (methods), model 4 with eight choice attributes was used as the baseline model (see Table 4.13). When comparing the -2LL (26) [-2 *LL of MNL (-3358) –LL of RPL (-3345)] with a Chi-square critical value (9.49) with four degrees of freedom at the 0.05 level, I could conclude that the PRL model was better than the MNL model. Also, in terms of adjusted ρ^2, the PRL model (0.19) was better than the MNL model (0.17).

The results of the MNL and RPL models of hotel choice were very consistent. That is, all variables had significant influence on hotel choice, except for sports facility. In both MNL and RPL, the room quality was the most important factor to influence hotel choice. When price is a fixed parameter in MNL, the price effect was the third most important variable. While price is a random parameter in RPL, the price effect was the second most important variable. Statistically significant parameter estimates for derived standard deviations for random parameters (i.e. price, entertaining, room quality) indicated the existence of heterogeneity in the parameter estimates over the sampled respondents. That is, this suggests preference heterogeneity in the price,

entertaining, and room quality factors across respondents. In service and food quality, however, there were no individual preference differences among samples. The random parameter selected normal distribution, which represents symmetry around a mean. Overall, the results suggest a high level of validity for two econometric models: MNL and RPL based on aggregated data.

Table 4.13 Comparison of the MNL and RPL Results Based on Aggregated Data

Attributes	MNL(multinomial logit) Parameter estimates	RPL (Random parameter logit) Parameter estimates
Price	-0.425***(0.027) [a]	-0.922*** (0.136)
Service & Food quality	0.321***(0.031)	0.545***(0.072)
National brand	0.1599***(0.035)	0.1278* (0.071)
Sport facility	-0.016 [NS](0.036)	-0.009 [NS] (0.074)
Comfortable	0.431***(0.028)	0.679*** (0.080)
Entertaining	0.103***(0.026)	0.191*** (0.058)
Room quality	0.797***(0.031)	1.658*** (0.216)
Overall atmosphere	0.146***(0.029)	0.273*** (0.062)
Standard deviation of parameter		
Price		1.374*** (0.259)
Service & Food quality		0.468 [NS](0.348)
Entertaining		1.235***(0.343)
Room quality		1.489***(0.275)
Model fit		
Log-likelihood function	-3358	-3327
Number of observation	5920	5920
Adj ρ^2	0.17	0.19
N of parameters	8	12
N of respondents	494	494

[a] Parentheses: standard errors.***= significant at the 0.01; **=significant at the 0.05; *=significant at the 0.1

In the leisure context, the magnitude of coefficient values in RPL was greater than that of MNL. The model fit of RPL was better than that of MNL, 0.27 to 0.21. Regarding national brand, there was no statistically significance on hotel choice in RPL, while it had significance on hotel choice in MNL. Three random parameters, price, entertaining, and room quality, were distributed with normal distribution and showed statistically significant parameter estimates for derived standard deviations, indicating the existence of heterogeneity in the parameter estimates

over the leisure respondents. In particular, price heterogeneity among leisure travelers was larger, followed by room quality and entertaining.

Table 4.14 Comparison of the MNL and RPL Results Based on the Leisure Context

Attributes	MNL(multinomial logit) Parameter estimates	RPL (Random parameter logit) Parameter estimates
Price	-0.531*** (0.042)	-1.359***(0.385)
Service & Food quality	0.295***(0.046)	0.576***(0.158)
National brand	0.171***(0.052)	0.155 ^{NS} (0.118)
Sport facility	0.024 ^{NS}(0.053)	0.163 ^{NS} (0.143)
Comfortable	0.509***(0.042)	0.929***(0.228)
Entertaining	0.094**(0.038)	0.171*(0.103)
Room quality	0.874***(0.046)	2.065***(0.519)
Overall atmosphere	0.064 ^{NS}(0.043)	0.161 ^{NS}(0.108)
Standard deviation of parameter		
Price		1.937***(0.603)
Service & Food quality		0.990 ^{NS}(0.698)
Entertaining		1.645**(0.667)
Room quality		0.142***(0.517)
Model fit		
Log-likelihood function	-1564	-1541
Number of observation	2876	2876
Adj ρ^2	0.21	0.27
AIC	3128	3106
BIC	3540	3035
N of parameters	8	12
N of respondents	249	249

In the business context, although there are preference heterogeneities in price and room quality among business travelers, the magnitude of coefficients of room quality was bigger than price factor, implying that business travelers focused more on room quality than price and in room quality, individual preference differences exist. Overall, the magnitude of coefficient values in RPL was higher than that of MNL and showed better model fit (0.15 in MNL and 0.17 in RPL).

Table 4.15 Comparison of the MNL and RPL Results Based on the Business Context

Attributes	MNL(multinomial logit) Parameter estimates	RPL (Random parameter logit) Parameter estimates
Price	-0.3361***(0.035)	-0.575***(0.123)
Service & Food quality	0.347***(0.043)	0.510***(0.082)
National brand	0.149***(0.049)	0.154*(0.079)
Sport facility	-0.052 ^{NS}(0.049)	-0.100 ^{NS} (0.089)
Comfortable	0.362***(0.037)	0.499***(0.073)
Entertaining	0.115***(0.035)	0.196***(0.066)
Room quality	0.740***(0.041)	1.276***(0.231)
Overall atmosphere	0.218***(0.039)	0.338***(0.073)
Standard deviation of parameter		
Price		0.834**(0.426)
Service & Food quality		0.298 ^{NS} (0.481)
Entertaining		0.729 ^{NS} (0.627)
Room quality		1.311***(0.438)
Model fit		
Log-likelihood function	-1772	-1762
Number of observation	3044	3044
Adj ρ^2	0.15	0.17
AIC	3545	3548
BIC	3748	3256
N of parameters	8	12
N of respondents	245	245

In sum, based on aggregate data, leisure data, and business data, the RPL model was better than the MNL model in terms of model fit and the magnitude of coefficient values. Also, in RPL, the standard deviation of random parameters provides information on individual preference heterogeneity. Overall, all results suggest a high level of validity for MNL and RPL models based on aggregated data and two different sets of context data.

4.5 Prediction Performance

In this dissertation, for prediction accuracy, root mean square error (RMSE)[25] between observed values (Y_{ij}) and predicted preferences ($\hat{Y}_{ij}$) for the hold out task was used (Andrews, Ansari, and Currim, 2002). The formula used is below.

$$RMSE(Y) = \sqrt{\frac{\sum\sum(\hat{Y}_{ij} - Y_{ij})^2}{IJ}}$$

In the choice context, the observed values (Y_{ij}) (16^{th} choice set) represent the actual choices that consist of 0 and 1 and the predicted values ($\hat{Y}_{ij}$) (the first fifteen choice sets) are the predicted probability that ranges between 0 and 1. The squared difference between the observed Y_{ij} and the predicted $\hat{Y}_{ij}$ was weighted by the number of respondents (i) and the number of choice sets (j). For RMSE calculation, the predicted probability values were obtained using 'Prob' command in MNL and RPL. Multinomial logit has a RMSE of 0.466 and PRL has a RMSE of 0.465. A smaller value for RMSE when using the same data suggests better fit. In other words, a smaller RMSE value means better prediction accuracy. The RMSE values for MNL and RPL were almost the same. The two models had the same level of prediction accuracy. That result shows that the MNL model is very accurate in terms of prediction accuracy and the predictive validity of the two discrete choice models used is reasonable.

[25] The Root Mean Square Error (RMSE) is an alternative term for the standard deviation. The greater the difference between predicted values and observed values, the greater the variance in the individual errors in the sample.

4.6 Summary of the Results

The purpose of this study was to examine how cognitive, affective, and sensory attributes affect consumer hotel choice. For this purpose, this study identified the relative importance of these attributes in hotel choice and the differences of choice attributes based on different choice contexts (leisure and business). Thus, the analysis tested hypothesis 1 concerning the relative explanatory power of models using a log-likelihood LR test. The moderation role of context in the relationship between choice attributes and hotel choice was examined via hypothesis 2. I summarized the main findings including the results of hypothesis testing in Table 4.16.

1. Reliability check (Spilt-half method): Cronbach alpha 0.956, implying that discrete choice analysis, which consists of 16 choice sets, was highly reliable and consistent.
2. Validity check of discrete choice analysis (Internality validity): two econometric models, MNL and RPL, were compared. The results showed that a discrete choice model for a hotel study was highly reliable and valid because its estimation results were pretty consistent across two procedures. That is, two models measured hotel choice well, showing consistent results. As I expected, the model fit of RPL was better than that of MNL in terms of model fit and the magnitude of part-worth (coefficients).
3. The relative importance of choice attributes on hotel choice: Except for sport facility, all seven attributes had significant influence on hotel choice. Based on MNL, room quality (0.797) was the most important attribute and comfortable (0.431) and price (-0.425) were the second and the third most important attributes in the hotel choice probability. Also, service and food quality (0.320), national brand (0.159), and overall atmosphere (0.146) also influenced hotel choice significantly.

4. Hypothesis testing: In this study, there are two main hypotheses. Hypothesis 1 consists of six sub-hypotheses and they were fully supported based on MNL and RPL models.
5. Hypothesis 2 consists of four sub-hypotheses and two proposed sub-hypotheses were supported, but h2a was partially supported in terms of sensory attributes in that, in terms of affective attributes, the comfortable factor was significant but did not support the hypothesized direction. In addition, h2c was not supported because no cognitive attributes except the affective comfortable feeling significantly influenced hotel choice among business travelers. Business travelers were also influenced by room quality, which supports h2d based on the MNL model. Specific findings about hypotheses are shown in Table 4.16. Thus, based on the results, overall, hypothesis 1 was supported and hypothesis 2 was partially supported.
6. Prediction performance (Root mean square error: RMSE): MNL has a RMSE of 0.466 and RPL has a RMSE of 0.465. The prediction accuracy of RPL and MNL was almost the same. This result shows the predictive validity of the MNL and RPL models in hotel context.

Table 4.16 Major Findings of the Hypothesis Testing

	Hypothesis	Results	Model Specification
H1a	The explanatory power of model 2, which includes both cognitive and affective attributes on hotel choice, will be greater than that of the base model, which includes cognitive attributes.	Supported	By MNL and RPL
H1b	When controlling for the cognitive attributes, the affective attributes will have a significant effect on hotel choice.	Supported	By MNL and RPL
H1c	The explanatory power of model 3, which includes both cognitive and sensory attributes on hotel choice, will be greater than that of the base model, which includes cognitive attributes.	Supported	By MNL and RPL
H1d	When controlling for the cognitive attributes, the sensory attributes will have a significant effect on hotel choice.	Supported	By MNL and RPL
H1e	The explanatory power of model 4 (full model), which includes cognitive, affective, and sensory attributes on hotel choice, will be greater than that of the base model, which includes cognitive attributes.	Supported	By MNL and RPL
H1f	When controlling for the cognitive attributes, the affective and sensory attributes will have a significant effect on hotel choice.	Supported	By MNL and RPL
H2a	In the leisure context, hotel choice will be more affected by affective and sensory attributes than by cognitive attributes.	Partially supported	By MNL and RPL Leisure travelers were influenced by atmosphere in hotel choice.
H2b	Leisure travelers will be more influenced by price on hotel choice than are business travelers.	Supported	By MNL and RPL Leisure travelers were very price sensitive.
H2c	In the business context, hotel choice will be more affected by cognitive attributes than by affective and sensory attributes.	Not supported	By MNL and RPL For business travelers, 'comfortable' was very influential on hotel choice.
H2d	Business travelers will be more influenced by room quality than are leisure travelers.	Supported	MNL supports this hypothesis.

CHAPTER V

DISCUSSION AND CONCLUSIONS

This chapter discusses the findings, contributions, and implications of the findings and limitations of this dissertation. The first section of the chapter includes the discussion of the hypothesis testing results. The second section includes the theoretical and methodological contributions and managerial implications of the findings. The final section addresses the study limitations and directions for future research followed by the conclusion of this dissertation.

5.1 Discussion of the Findings

This study aimed to understand the differential effects that cognitive, affective, and sensory attributes have on consumer hotel choice. Through this process, this dissertation examined the value of incorporating an experiential approach into hotel choice modeling. Another purpose was to examine how the effect of choice context influences the relative importance of affective and sensory attributes as compared to cognitive attributes in hotel choice. For these research objectives, there were two research questions that are related to two hypotheses.

This dissertation identified the relative importance of cognitive, affective, and sensory attributes on hotel choice based on MNL and RPL stated choice modeling. It also provided evidence of the moderating effects of context on the relationship between cognitive, affective, and sensory attribute and hotel choice. In the section below, I discuss the findings of the hypothesis testing in more detail.

5.1.1 Research Question 1 and Hypothesis 1

For the first research objective, I examined the first research question: what is the relative effect of cognitive, affective, and sensory attributes on hotel choice? This research question was explained based on hypothesis 1, which consists of six sub-hypotheses. The six hypotheses of H1 were fully supported based on the MNL and RPL results.

5.1.1.1 The Relative Importance of Cognitive and Affective Attributes on Hotel Choice

The results of hypothesis 1a showed that model 2 with both cognitive and affective attributes (comfortable and entertaining) explained hotel choice better than model 1 (base model), which only has cognitive attributes. Based on a log-likelihood test of MNL and RPL, -2LL values (454 in MNL) based on the log-likelihoods for models 1and 2 were calculated and compared with a critical Chi-square value (5.99 in MNL) at the 0.05 level. Hypothesis 1a was supported. Also, in terms of goodness of fit of the model, the model fit of model 2 showed better fit levels (MNL: 0.07 / RPL: 0.09) than the model fit of model 1 (MNL: 0.03 / RPL: 0.07), implying better explanatory power. Thus, in terms of the LR test and model fit measures including *adj* ρ^2, *AIC,* and *BIC,* model 2, which includes affective attributes, explained hotel choice better than the base model, which only has cognitive attributes. The results imply that customers consider affective attributes, in particular, a comfortable feeling, together with cognitive attributes in hotel choice.

Through an additional test, I identified the relative importance of cognitive and affective attributes on hotel choice by checking the coefficients (part-worth values). The result of hypothesis 1b was supported by showing that when controlling for cognitive attributes, two affective attributes were statistically significant on hotel choice. When two emotions are

compared, a comfortable feeling (such as a safe and relaxed feeling) cannot be compromised for other factors because customers think that a comfortable feeling is the most fundamental requirement. In terms of the coefficients, a comfortable feeling was the most important factor, followed by service and food quality, price, national brand, and entertaining.

Previous studies show that in initial choice, cognitive attributes (e.g., location, brand name, and price) were important, while in repeat visits, customers put more emphasis on affective attributes, such as emotional feelings due to staff attitude and efficiency during reception or personal service (Choi and Chu, 2001; Dube and Renaghan, 2000; Yavas and Babakus, 2005). That is, longer staying and repeat travelers focus more on emotional aspects (comfortable and fun atmosphere) than do first time travelers. In addition, this study showed that before a hotel stay, when hotel customers choose a hotel for leisure travel or a business trip, they have high expectations on affective attributes, in particular, for a safe and comfortable stay. On this point, this study is distinct from previous studies that focused on affective attributes (or emotions) in the post-consumption process after a hotel experience. That result of my dissertation implies that this emotional aspect was critical to hotel choice for both leisure and business purposes. This result is similar to Dube and Renaghan (1999)'s findings that guests staying in a hotel seek a comfortable stay, a feeling of relaxation, and a sense of security. So, for future study, it is necessary to incorporate emotional attributes (such as comfortable, safe, and secure feelings) in hotel choice research.

5.1.1.2 The Relative Importance of Cognitive and Sensory Attributes on Hotel Choice

The results of hypothesis 1c showed that the explanatory power of model 3 with both cognitive and sensory attributes was greater than that of the base model with only cognitive

attributes. Based on the LR test, -2LL values of the LL of models 1 and 3 were calculated and compared with a Chi-square value at the 0.05 level. In terms of model fit measures, *adj* ρ^2, *AIC,* and *BIC*, model 3 (MNL: 0.14 and RPL: 0.17) was much better than the base model (MNL: 0.03 and RPL: 0.07). It means that compared to model 1, the explanatory power of model 3 was larger. In particular, sensory room quality was the most necessary requirement in that the basic fundamental product that a hotel provides to customers is the sleeping room itself. The result implies that sensory attributes are a must product, not an additional accessory.

An additional test that controlled for cognitive attributes revealed that sensory room quality and atmosphere were significant on hotel choice. The results showed that room quality (0.789) was the most important factor, followed by price (-0.348), service and food quality (0.3078), atmosphere (0.197), and brand (0.1765). One of the interesting findings was about the effect of brand. Brand was statistically significant on MNL, whereas it was not statistically significant on RPL. Although there was a difference of statistical significance depending on whether MNL or RPL was used, the utility coefficient of atmosphere was bigger than that of national brand. Customers recognize overall hotel ambience as a more important factor than the fact that a hotel is a well-known brand name.

One of the key characteristics in sensory attributes is that they are related to the five senses and operate simultaneously, not separately. Because of this characteristic, this dissertation assumed that overall room quality, instead of separate items, influences hotel choice. For example, based on the exploratory factor analysis, a comfortable bed and pillow, quietness, cleanliness, bathroom amenities, and temperature were grouped as overall room quality. Similarly, music, interior of room, and exterior of hotel were grouped as overall hotel ambience or atmosphere and overall atmosphere influences, instead of considering separate music or

interior on the hotel choice decision. These composite factors (room quality and overall atmosphere) were used as sensory attributes in choice modeling.

5.1.1.3 The Relative Importance of Cognitive, Affective, and Sensory Attributes on Hotel Choice

The results of hypothesis 1e showed that the explanatory power of model 4 with the cognitive, affective, and sensory attributes was greater than that of the base model with only cognitive attributes. Log-likelihood tests showed that -2LL values for models 1 and 4 exceeded a critical Chi-square value at the 0.05 level. Also, in terms of model fit measures (*adj* ρ^2, *AIC*, and *BIC*), model 4 explained them better than the base model. The results imply that customers consider not only cognitive attributes (e.g., price, service and food quality, and brand name), but also affective (e.g., comfortable feeling and entertaining) and sensory (e.g., room quality overall atmosphere) attributes.

An additional test, which controlled for cognitive attributes, revealed that four affective and sensory attributes were statistically significant on hotel choice. Based on MNL, in terms of the strength of effects among attributes, room quality (0.797) was the most important variable, followed by comfortable (0.431), price (-0.425), service and food quality (0.320), brand (0.159), atmosphere (0.146), and entertaining (0.103). This result is similar to the findings of Choi and Chu (2001) that service quality, room quality, and value are the influential factors on likelihood to return to the same hotel. When I used an RPL model to identify the magnitude of part-worth, however, the order of preference for choice attributes was a little different from that of MNL. In RPL, which represents individual preference heterogeneity among samples, when price, service and food quality, entertaining, and room quality were treated as random parameters, the

coefficients were bigger than those of MNL. Room quality was still the most important, price was the second most important, and comfortable feeling was the third most important factor. In sum, the order of coefficients in RPL was room quality (1.658), price (-0.922), comfortable (0.679), service and food quality (0.545), atmosphere (0.273), entertaining (0.191) and national brand (0.127). Owing to the standard deviation effects of random parameters, the effects of coefficients to influence hotel choice were a little bigger in RPL than in MNL. Specifically, when there was individual preference heterogeneity among random parameters, the coefficients tended to be larger, as shown in price (-0.425 ⟶ -0.922), room quality (0.797 ⟶ 1.658), and entertaining (0.103 ⟶ 0.191), implying that there are individual unobserved taste differences of price, room quality, and entertaining variables among respondents. Thus, the RPL model performed better than MNL in terms of the strength of part-worth and model fit. This result is consistent with the findings of previous studies (e.g., Beharry-Borg and Scarpa, 2010; Green and Hensher, 2003; Zhu, 2007) that mixed (random parameter) logit models outperformed the MNL models.

Based on open-ended questions, the three most important keywords in hotel choice were safe, comfortable, and clean. That is, most respondents studied in this dissertation preferred a hotel that elicits safe and comfortable feelings and provides a clean and quality room regardless of travel purpose. The next consideration was price and service and food quality. The third most important factors were overall atmosphere, entertaining, and national brand. In particular, female customers (i.e., a female who travels alone for business) cared much more about the safety and security of a hotel. This result is similar to previous studies (e.g., Lewis, 1984a; McCleary et al., 1994; Yung and Chan, 2001) that found that female customers tend to be more sensitive to cleanliness and security.

In addition, based on the results of the comparisons between models 2 and 4 and between models 3 and 4, the relative importance of sensory attributes was greater than that of affective attributes. In particular, these results emphasize the fact that the main product of a hotel is a quality room, although sensory and affective attributes are highly related to each other and may influence each other.

In sum, this study provides two important findings. First, this study showed that the addition of affective and sensory attributes into the model with cognitive attributes can help better explain hotel choice. When hotel customers choose a hotel for leisure or business purposes, they consider cognitive attributes (e.g., price, service and food quality, and brand name) and affective (e.g., comfortable feeling and being entertained) and sensory attributes (e.g., room quality and overall hotel atmosphere), while using cognitive and experiential systems simultaneously. Moreover, the relative importance of sensory and affective effects as fundamental requirements was greater than that of cognitive effects regardless of contexts. Accordingly, hotel managers need to fully utilize this crucial finding in marketing communications and product development strategies. Second, this study showed the importance of the emotional aspect in the pre-consumption process in hotel choice studies. If hotels do not create pleasant emotional experiences for guests, hotel corporations cannot differentiate their brands from competitors and will not succeed in their businesses.

5.1.2 Research Question 2 and Hypothesis 2

The other research question is: how does the choice context influence the relative importance of cognitive, affective, and sensory attributes in hotel choice? That is, what are the moderating effects of choice context on the relationship between consumer choice attributes and

hotel choice? The second research question is explained based on hypothesis 2, which consists of four sub-hypotheses. Overall, hypothesis 2 was partially supported. The results showed that among eight attributes, four attributes (price, comfortable, room quality, and atmosphere) had significant moderating effects of context on hotel choice. The specific results follow.

First, the results clearly show that interaction effects exist between choice context and the importance of hotel attributes. Previous hotel choice studies have depended heavily on fractional factorial experimental designs wherein interaction effects are rarely examined. By using the Bayesian D-optimal design, this study is among the first choice studies to explicitly document the existence and magnitude of these interaction effects.

Second, the results showed that hypothesis 2a was partially supported. The results are consistent with previous studies (Cohen et al., 2008; Dube and Renaghan, 2000) that show that, leisure travelers are influenced by affective and sensory attributes more than by cognitive attributes. Like previous studies, this study showed that on one hand, leisure travelers were influenced by sensory attributes (e.g., overall atmosphere) more than by cognitive attributes. This result is similar to Dube and Renaghan's (2000) and Juwaheer's (2004) studies that found that for leisure travelers, guest room design and exterior are important attributes that influence repeat patronage and choice intention. On the other hand, in terms of affective attributes, comfortable was significant but did not support the hypothesized direction. That is, contrary to expectations, a comfortable feeling was more influential among business travelers than leisure travelers. A possible explanation is from different choice contexts to different respondent groups. For the business context, respondents imagined taking a business trip by himself/herself to Chicago with a business travel budget. For the leisure context, respondents imagined taking a family vacation to Orlando to visit Disney theme parks at their own expense. Compared to leisure travelers with

families, business travelers who travel alone put more emphasis on feelings such as safe and secure and comfortable.

Third, the results showed that compared to business travelers, leisure travelers were, as expected, more influenced by price. Thus, hypothesis 2b was supported. To test the effects of price, I manipulated the price condition differently in the leisure and business contexts. Leisure travelers travel at their own expense while business travelers are supported by a company or organization. The study's results showed that leisure travelers were more price sensitive than business travelers. This is consistent with Clow et al.'s (1994) previous study that among leisure travelers, price is the main factor in both initial and repeat hotel choice. Furthermore, the results showed that price had a negative and significant coefficient, implying that a high price will reduce the probability of hotel choice. The price sensitive tendency of leisure travelers was found in the results of respondents' recent hotel stays. The use proportion of upper-upscale hotels by business travelers (43.7 percent) was higher than that of leisure travelers (31.3 percent), while the use proportion of mid-range hotels of leisure travelers (28.5 percent) was higher than that of business travelers (20 percent). Sometimes a company has established contract prices for mid-range hotels. However, as most business travelers can choose a hotel within an upper limit on room price, they tend to stay at least at upscale hotels that provide quality rooms and are located in safe and convenient environments (i.e., walking distance to restaurants or activities or proximity to a conference).

Fourth, based on previous literature, the premise behind this hypothesis is that business travelers are more influenced by cognitive attributes than by affective and sensory attributes. Contrary to my assumption, however, business travelers did not more put more emphasis on any cognitive attributes. Thus, hypothesis 2c was not supported. There are two possible reasons for

this result. First, as Dube and Renaghan (1999) argued, business travelers are more concerned with convenience, productivity, and time saving, and consider location as their first priority for convenience. For example, business travelers prefer a hotel that is close to the locations of meetings or conventions (or business destination) or that provides a free airport shuttle to and from the hotel. Although location is the most important factor influencing hotel selection for business travelers (Lewis, 1984b; McCleary et al., 1993), I controlled for this effect in the business context due to the limitation on the number of attributes in the choice experiment. That is, in choice modeling, as the number of attributes and levels increases, the experimental design becomes dramatically more complicated. This did not allow me to use many specific attributes in the design (i.e., location, reward/loyalty program, Internet access) that may be more meaningful for business travelers compared to leisure travelers. Although, for business travelers, reward/loyalty program and Interact access are important factors to select a hotel, their effects were not considered in the choice experiments. Another reason is that, as I mentioned above, when business travelers take a business trip alone, they are more likely to emphasize the safe and comfortable stay in a safe environment than leisure travelers. However, as leisure travelers take their trips with family members, the relative importance of a comfortable feeling including safety may be reduced. Owing to security, most customers prefer inside room entrances, not motel style.

Fifth, business travelers were more influenced by sensory room quality than leisure travelers. Hypothesis 2d was supported based on MNL results. Room quality was the most important factor to both leisure and business travelers, but, the relative importance of this factor was greater among business travelers than leisure travelers for two possible reasons. First, as O'Neil and Xiao (2006) found that a good night's sleep was very important for the next day's efficiency, this dissertation showed that business travelers who had a business trip within 12

months recognized room quality (a clean and quiet room that is equipped with a comfortable bed) as the top priority. Another reason is that business travelers who are supported by a company or organization are less price sensitive, and therefore the relative importance of room quality for business travelers can be larger than for leisure travelers who are price sensitive.

In addition, according to open-ended comments from respondents, although service and food quality did not show a significant interaction effect with context, business travelers put more emphasis on food quality on site such as free breakfast and decent restaurants or lounge because they do not have enough time to eat outside and/or to find local restaurants. According to the results of open-ended questions, most customers trust brand names when they travel a lot and to a place they are not familiar with. However, when a friend, family or a travel agent recommends an independent hotel, they tend to use those independent hotels. Regarding preferred brands of each context, in the leisure context, some customers prefer Hampton Inn that provides continental breakfast at a reasonable price. In business travelers, some customers prefer or use Courtyard by Marriott frequently because their companies selected this hotel brand in terms of discount rate, implying that this brand is appealing to the business community. Brand can be important, but not always the best. Their previous experience and recommendations by friends and family were more influential than brand name. When customers do not have much experience with a hotel, they tend to obtain information through Internet sites (such a Tripadviser or hotel websites) to reduce risk. Compared to room quality, a comfortable feeling, and price, the effects of sport facility and entertaining were not significant on hotel choice. One of the reasons is that in Orlando and Chicago, there are many fun things to do and see such as Disney theme parks, tourist attractions, and a variety of off-site restaurants. Thus, the relative importance of these attributes was reduced and may not be significant. As the main purpose of hotel customers

is to sleep, not entertain, the result that the most important priority was the quality of room is not surprising.

Finally, with the exception of four choice attributes (price, comfortable, room quality, and atmosphere) that showed significant interaction effects with context, the leisure and business groups showed fairly homogeneous preferences in the hotel choice attributes.

5.2 Contributions and Implications of the Study

5.2.1 Theoretical Contributions

First, based on Holbrook and Hirschman's (1982) experiential approach, Epstein's (1999) CEST theory and dual processing theory, and Shaw's (2005, 2007) and Schmitt's (2003) experiential dimensions, this dissertation conceptualized the hotel experience choice attributes that influence hotel choice in three segments – cognitive, affective, and sensory attributes. That is, this study assumed that consumer experience consists of cognition, affect, and sensory attributes, which continually influence each other. Although hotel choice studies have advanced our understanding of customers' decisions in hotel selection, the existing hotel choice studies have not been consistent in attributes, market segment, and data technique. For example, previous studies regarded sensory attributes as cognitive and functional aspects. As hotels provide more commoditized products and services, product differentiation may increasingly be based on experiential attributes and less on cognitive facts or features in terms of experiential differentiation that distinguishes them from competitors. Although interdependent or a little blurred, cognitive (functional) attributes and sensory attributes need to be differentiated. In this study, I specified physical and functional attributes into knowledge-based cognitive attributes (e.g., price and brand name) and experiential sensory attributes that are related to five more

senses. Another limitation of previous hotel studies is that they focused only on cognitive and some sensory attributes, while not considering and integrating affective attributes (emotions) into the hotel choice model. Hospitality and tourism products are in essence experiential (Williams, 2006). Thus, while customers are regarded as rational thinkers and emotional seekers from an experiential marketing perspective, hotel corporations should consider customers' emotional expectations and the senses evoked while creating memorable experiences based on cognitive products and services. This study explicitly considered affective (i.e., emotional) attributes and incorporated them into the hotel choice model. In sum, this study provides the systematic categories for hotel choice attributes in terms of various consumer experiences, while incorporating emotional effect in hotel choice.

Second, by showing the relative importance of experiential (affective and sensory) attributes on hotel choice through empirical study, this dissertation demonstrated the value of incorporating an experiential perspective into hotel choice modeling. Since Holbrook and Hirschman (1982) argued that an experiential view with a cognitive information process should be considered to understand consumer behavior, some researchers have incorporated an experiential approach into a cognitive information approach (Havelna and Holbrook, 1986; Frow and Paynes, 2007; Neelamiegham and Jain, 1999) in consumer behavior studies. However, this concept is not prevalent in the hospitality and tourism literature with the exception of a few studies by Ladhari (2009) and Gursoy et al. (2006). That is, there were few efforts to incorporate both cognitive and affective attributes into a choice model. Further, the limited studies deal with an experiential approach or customer emotions only in terms of the post-consumption process (e.g., Martin et al., 2008; Oh et al., 2007). By demonstrating the relative importance of affective and sensory attributes on hotel choice, this study showed that an experiential approach should be

incorporated into choice modeling to better understand hotel choice behavior. That is, when considering a simultaneous variety of choice attributes based on cognitive (price, location, service, and brand) and experiential aspects (comfort and security, being entertained, and ambience), the results showed that customers prefer a hotel that provides a quality room at a reasonable price in a comfortable and safe environment.

Finally, and related to the above, this dissertation is unique in considering the emotions in a pre-consumption hotel choice context. This study showed that before a hotel experience (stay), affective attributes (responses) or emotions significantly influence choice decisions and probability, supporting Kwortnik's (2003) finding that positive emotions play a crucial role for experiential products like hotels. Most previous studies in the hospitality literature have focused on emotions that influence revisit intention or customer satisfaction after a hotel experience. However, this study demonstrated that anticipated (expected) affect also influences choice or decision making in a hotel choice context. The empirical results of MNL and RPL imply that, when they chose a hotel for leisure and/or business purposes, customers had high expectations for a comfortable and safe hotel stay. In practice, most customers have experienced a hotel and have some expectations for future stays. Based on their experience and/or imagery, they will select hotels that are expected to satisfy them in terms of safety and security, comfort and relaxation, and happy experiences during their stay. This result is consistent with Philips et al.'s (1995) argument that emotions linked to imagined consumption as a substitute experience can influence decision making and choice. In addition, this concept aligns with other researchers' findings (e.g., *emotional expectations* of Neelameghan and Jain, 1999; *feeling as information* of Pham 1998; *consumption vision* of Philip, 1996; *anticipated satisfaction* of Shiv and Huber,

2000). This result showed that the relative importance of this effect may be greater than we expect and therefore emotions should be included as an influential factor on hotel choice.

5.2.2 Methodological Contributions

First, to identify the relative importance of choice attributes, this dissertation employed discrete choice modeling that is rarely used in the hospitality and tourism literature and demonstrated the usefulness of choice modeling in hotel choice studies. Hotel choice attributes have been examined frequently in the hospitality and tourism literature, but most previous studies have used multi-attribute methods, such as the rating of importance to attributes. However, the rating (or ranking) method of important attributes has limitations reflecting the real trade-off among attributes, and does not identify the relative importance of attributes in hotel choice decisions. Thus, Dolincar and Otter (2002) argued that a more complex survey instrument such as conjoint analysis[26] is necessary to represent a trade-off situation and utility maximization. The discrete choice analysis (DCA) is a more advanced method in that it provides a robust and systematic way to identify the relative importance and attribute trade-offs revealed by customers' choices and allows more complex analyses through MNL and mixed (RP) logit models. The discrete choice modeling method has been more widely used in transport, environment, agriculture, and marketing. As Green, Krieger, and Wind (2001) argue that while areas like tourism, entertainment, health maintenance, and gambling commonly apply conjoint applications, discrete choice analysis is a more useful method. In the hotel industry, however, it is not common to use conjoint analysis except for Wind et al.'s (1989) study that used conjoint analysis to develop Courtyard by Marriott. This dissertation demonstrated that discrete choice analysis

[26] Conjoint study is marketers' favorite method for knowing how customers make trade-offs among competing products (Green et al., 2001).

(so called choice based conjoint (CBC)) can be used as an efficient marketing research technique in that customers consider a variety of attributes or aspects simultaneously when they choose a hotel.

Second, this study employed two methods, MNL and RPL, to check the validity of the discrete choice model. In the literature, most previous studies have used only MNL, which is a fundamental method in choice modeling. However, MNL has limitations due to its rigid IIA assumption and deficient representation of real behavior. Thus, recent studies (e.g., Birol et al., 2006; Greene and Hensher, 2003, McFadden and Train, 2000) employed other methods (i.e., more flexible specifications or methods, such as mixed (or random parameter) logit, latent class, and nested logit) to estimate models and to compare performance in terms of prediction and explanatory power. Reflecting recent trends, this study used both RPL and MNL, which provides the validity of a choice model and improves the robustness of the obtained values. In sum, this study provided guidance for future research in that, by using more advanced models and methods, consumer choice behavior can be examined in more detail and from various perspectives such as marginal effects, simulation, and prediction.

Third, this dissertation employed the detailed procedure of Bayesian D-optimal design creation through the pilot and main surveys using the JMP design of experiment (DOE) and qualitative study (e.g., in-depth interviews with customers, managers, and faculty). This is one of the first studies in the hospitality and tourism literature to use optimal design and it showed the usefulness of D-optimal design as compared to the previously used orthogonal fractional factorial design. For successful discrete choice modeling, the first task is to create an appropriate choice design for research purposes, while deciding the number of attributes, levels, choice sets, survey designs, and neither option. In terms of design for discrete choice modeling, recent trends

in other areas such as transportation, environment, and health studies have moved away from orthogonal design toward optimal design (Hoyos, 2010) because the model in choice experiments is in essence non-linear and the parameters estimated are not based on the design, but on non-linear data. The use of optimal design over orthogonal design is growing in that optimal design is the most desirable to maximize information, while reducing the standard errors and requiring smaller sample sizes, leading to potential cost savings. In particular, as prior information based on a pilot survey can help the design in terms of lower standard errors and smaller sample size (Hoyos, 2010), I employed the results of the pilot survey for this dissertation's main survey. Based on my experience using SPSS fractional factorial design and JMP DOE, D-optimal design in JMP DOE performed better than SPSS orthogonal design in terms of ease of use and a variety of functions. Given the complex product characteristics that may cause a mixture of hospitality and tourism products, the usefulness of experiment design in the industry will be more prevalent in areas such as marketing and transportation. On this point, this dissertation can provide guidance on how to create an optimal (or efficient) design for choice modeling, beyond the scope of the limited orthogonal fractional factorial design that has commonly been used in the hospitality and tourism industry.

5.2.3 Managerial Implications

In addition to its contributions to the academic literature, this dissertation also offers hotel managers suggestions for their marketing strategies. Understanding the relative importance of hotel attributes is critical for hotel success. Further, the importance of affective and sensory attributes that this study demonstrated is highly relevant for many hotel corporations. Hotel

managers can use the results to understand consumer preferences and improve their product offerings based on customer needs and wants.

First, this study suggested that hotel managers need to focus more on experiential marketing to differentiate their brands from competitors because most hospitality and tourism products are essentially experiences (Tsaur et al., 2006). That is, hotel managers should provide memorable and pleasant experiences to customers, not just focus on physical function. As physical performance is recognized as a basic requirement, it is not good enough to focus on physical performance (e.g., price and location) to differentiate hotels from other hotels in that price and location are not flexible and cannot be changed easily. As the price of accommodation increases, customers' expectations of the affective and sensory attributes increase. Thus, the difference between an economy hotel and upscale or luxury hotel does not depend on just the cognitive price and service level, which simply meet basic functional needs and wants, but upon the unique and memorable experiences and content hotels provide. Specifically, to capture customers' imagination, hotel corporations need to utilize an imagery-eliciting strategy that uses various sources such as vivid pictures, instruction to image, guided imagery in advertisements, (e.g., websites), and marketing communications to retain and attract more consumers.

In the hotel industry, brands are becoming recognized important intangible assets and a firm's brand portfolio strategy is critical for business success in terms of marketing and financial performance (Aaker, 2004; Morgan and Rego, 2009). Marriott strategically manages its portfolio based on price/value and customer usage (e.g., Ritz-Carlton, Marriott, Courtyard by Marriott, and Fairfield Inn). When hotel brand managers develop a new brand (sub-brand) and/or products, they need to differentiate and leverage the brand by further considering emotional attributes and/or sensory attributes in terms of experiential value. In this view, Westin's heavenly bed

brand is a successful case of revolutionizing the hotel industry by focusing on room experience to differentiate and gain market share. Therefore, hotel managers need to keep in mind that a corporate brand may work best when it not only delivers a functional benefit (e.g., technology and service), but also emotional value and benefit because the emotional aspect of products and their distribution system will be the key factor in a consumer's ultimate choice and willingness to pay (Aaker, 2004; Gobe, 2001). In sum, they should consider the total experience with a brand and focus on the "experience design" that considers the moments of interaction between people and brands to create memorable experiences (Ardill, 2005).[27] Hotel corporations can affect customer experience through promotion and distribution channels such as advertising, websites, service delivery, and physical environment.

Second, hospitality managers need to know the emotional dimensions of the customer experience and the ways to meet their emotional needs because customers evaluate hospitality experiences primarily in emotional terms (Lashley, 2008). While customers are stimulated by the company or brand strategy, their purchases are influenced by emotions that are affected by their experience during their stay or imagined (or expected) emotions based on the previous experience and marketing communication. Thus, an important question is: when customers choose a hotel for leisure or business purposes, what kind of affective attributes do they seek? Although previous studies show that leisure travelers seek a comfortable stay, this dissertation found that business travelers also put emphasis on a comfortable and safe stay far more than we expected. Thus, if the main target of hotels is business travelers who travel alone for conferences or sales meetings, hotel managers should focus more on comfortable feelings (relaxed,

[27] Ardill, R. (2005). About: Experience Design, *Design Council* from http://www.experientia.com/blog/files/design_council_exp_design.pdf (Accessed on July 10, 2011).

comfortable, secure and safe, friendly, welcoming, happy, and contented), beyond considering convenience and saving time. As emotions are influenced by employee attitudes and behavior, hotel managers need to care about employee training and morale to provide better service to customers. Emotions critically influence future decisions or choice intentions. In particular, female customers tend to be more emotional than male customers. Before making a final decision, emotions based on previous experience highly influence future decisions or revisit intentions. Brand is important, but the best and previous experiences based on emotion are more influential in choosing a hotel. In particular, independent hotel managers need to focus more on emotional dimensions so that new customers become repeat customers when compared to brand name hotels.

Third, hotel managers need to conduct differentiated marketing strategies based on travel purpose and target segmentation. This dissertation showed that leisure travelers are more price sensitive as compared to business travelers and business travelers focus more on room quality for their work efficiency. Thus, given their needs and characteristics, hotels should establish and perform different marketing communication plans to adjust their wants and needs and to maximize the effects. For example, a little expensive but quality room will appeal more to business travelers. They want to earn reward points for future use. Hotel rooms which are equipped with basic functions at a reasonable price will appeal more to leisure travelers who travel with family and want a short stay (e.g., one-night). Hotel managers should understand customers' basic needs (a quality room with a comfortable and safe stay) and try to meet those needs in the hotels' basic functions and performance.

Finally, hotels need to employ the discrete choice model for marketing to understand how customers trade off choice attributes and identify the relative preference differences because

stated preference models can support important managerial decisions. Most hotels use customer evaluation surveys, but their survey instruments are very simple and do not provide a lot of information to hotel marketing plans. Because many choices in the hospitality and tourism industry are complex and many variables are considered simultaneously, discrete choice modeling is an effective method to assess the trade-offs that consumers make and to determine real preferences from the customer perspective. This method can be useful for forecasting changes in customer behavior and estimating new products with new attributes and features. Thanks to new advanced technology, discrete choice analysis will be used more often in the hospitality and tourism industry.

5.3 Limitations and Future Research

5.3.1 Limitation of the Study

There are several limitations to this study. First, one of the challenges in discrete choice analysis is the limited number of attributes and levels which are related to the cognitive burden of respondents. To reduce the cognitive burden of respondents, the number of choice attributes is limited to less than ten variables and the average number of attributes is seven.[28] Although this study used factor analysis to identify representative composite attributes and obtained orthogonality between attributes, because of the limitation on the number of attributes, some specific choice attributes (e.g., location, reward/loyalty program, and Internet access) which may be crucial for business travelers were not incorporated into the hotel choice modeling. This is a trade-off problem between respondents' cognitive overload and maximization of information

[28] Generally seven attributes plus or minus two attributes can cover most models (Discrete Dependent Variable Models: Chapter 5; Section A: Logit, Nested logit, & Probit from http://onlinepubs.trb.org/onlinepubs/nchrp/cd-22/v2chapter5.html (Accessed on April 20, 2011).

based on more attributes. This issue may be related to choice consistency to obtain accurate estimation. For specific information, more specific attributes should be included in different choice models in future research.

Second, for data collection, this study used an online survey through the Internet. Because of the characteristics of a web survey, not everyone can access the computer and the Internet. Thus, it may compromise the generalizability of the population because the sample population is somewhat biased and may not represent all hotel customers in the US. Respondents were Caucasian with a high degree of education (more than a college degree) and relatively high incomes. Accordingly, the results may represent middle-class white Americans with a lot of education, but caution should be used when applying the results to Asian Americans or Hispanic Americans.

The third limitation of this dissertation is that I did not conduct a realism test to determine how realistic the scenarios used in the pilot test were, as shown in Magnini and Karande (2009)'s study. Perdue and Summers (1986) stated that extensive manipulation testing at the pretest and/or pilot phases of an experiment has great value because poorly designed manipulation can still be amended and the main experiment saved. Thus, an experimental realism test is needed for this study to modify the choice scenarios of the main experiment and make them more realistic. "Realism can be conceptualized on two dimensions: experimental realism and mundane realism" and experimental realism means how the study is perceived as realistic by study subjects (Dobbins, Lane, and Steiner, 1988, p. 284). As a field study has mundane realism (Dobbins et al., 1988), in the choice experiment, it is desirable to combine the revealed preference data that represent real choice with hypothesized stated choice modeling for the study's external validity.

The final limitation is related to the number of choice sets I used in the main survey. In the pilot survey, I used nine choice sets. Based on the results of the pilot survey, I extended the number of choice sets to 16 to maximize information from customers and to identify individual preferences for mixed logit. Although the first half of choice sets (1~8 choice sets) and the second half of choice sets (9~16 choice sets) were highly reliable (0.956) by checking reliability, the selection of the neither option in the last choice set (the 16^{th} set) was relatively high (20 percent), compared to the selection of neither in the other 15 sets (15 percent). In the process of checking data for LIMDEP analysis, I deleted some bad data (e.g. a few surveys with all neither options). That may explain one reason that I did not obtain excellent model fit in the MNL (0.17) and RPL (0.19) models, as compared to the MNL result of the pilot survey (0.28). Thus, for future research, we need to be more careful determining the number of choice sets and the number of attributes. For future choice modeling, based on my experience, it is desirable to have about 12 choice sets (or a maximum 13), considering respondent burden and the number of attributes.

5.3.2 Direction for Future Research

While this dissertation addressed many aspects of the experiential approach and the importance of emotions in the hotel choice context, several interesting issues remain for future research.

First, customer experience management and experiential marketing would be an important area in the hospitality and tourism literature. As understanding consumers' emotional needs and desires is the key to success in the hospitality and tourism industry, future research needs to focus more on customers' emotional experiences to create long-term value by

establishing emotional bonds with customers. Gobe (2001) argues that the emotional aspects of products are a key to consumers' ultimate choices and their willingness to pay a particular price. In terms of sensory marketing, hotel products are in essence experiential products stimulated by senses and the customer sensory experience is a crucial element to establishing an emotional bond with customers. Yet, sensorial experience and related studies are not fully explored, which may provide good potential for brand management. In this regard, an important inquiry is: which combinations of music, interior, exterior, including lighting furniture, and designs can affect the behavior of hotel customers, such as preference and future choice decisions. As customers are exposed to web sites and use the Internet for information searches and customer reviews (e.g., Tripadviser) before making a decision, future research needs to examine the e-commerce brand image strategy, which can provide visual brand experience opportunities and plays a crucial role in linking emotional bonds between consumers and hotels in terms of experiential marketing.

Second, this study is an initial attempt to incorporate affective attributes and cognitive attributes in a discrete choice model in the hospitality literature. Future study in the hospitality and tourism literature needs to include more studies that incorporate an experiential approach (or emotions) and attitudinal constructs into choice modeling to examine and to demonstrate the validity of this explanatory study. Both the hospitality industry (e.g., hotels, restaurants, airlines) and the tourism industry (e.g. destination marketing organizations, resorts, event organization) may need to consider both cognitive and affective attributes simultaneously in customer decisions in order to validate this concept and to identify the relative importance of related attributes so that DCA can assess the trade-offs that consumers make and determine real preferences.

Third, this study employed discrete choice analysis that is rarely used in the hotel choice context even though the method has already been widely developed in other areas, such as transport economics, environment, health economics, agriculture, and marketing. Hotel attribute studies need to exceed the existing multi-attribute utility methods and extend the scope of studies by using more advanced methods of discrete choice modeling. Future hotel research needs more specified and advanced discrete choice analysis (e.g., Adaptive Conjoint Analysis (ACA)) to contribute to the hospitality and tourism literature. As respondents cannot evaluate several attributes at the same time due to information overload, in this view, ACA is the preferred conjoint method in that it can include up to 30 attributes, which is more than is possible with choice based conjoint (6 or 7 attributes).[29] The term "adaptive" refers to the fact that a computer-administered interview should be used for each respondent and based on previous answers, the next questions are selected to obtain the most information from respondent' (Sawtooth Software, 2007). However, ACA is a main-effects model and when price is included as one of many variables, its importance can be underestimated (Orme, 1996). On the other hand, in hotel choice studies, given the number of choice attributes, it is desirable to focus on the specific context (leisure context or business context) for the information and to incorporate more specific attributes (e.g. reward /loyalty program, location, Internet access, airport shuttle, etc. for business travelers) to represent the study population's needs and wants fully in the discrete choice experiment. Moreover, beyond the travelers' purposes (business or leisure), future studies need to extend the scope (or context) to more specific situations or destinations (e.g., city versus resorts - resort hotel, downtown hotel, or airport hotel) to obtain more specific information for

[29] Orme, B. (1996), Which Conjoint Method should I Use? Sawtooth Software from http://www.researchinfo.com/docs/library/which_conjoint.cfm (Accessed on July, 8, 2011).

each situation. With rapid changes in technology, discrete choice modeling can be a potentially useful tool to predict different scenarios. Based on the results and implications of this dissertation, considerable methodological advances should be made in future studies.

Finally, future research that employs multiple methods is needed to improve the robustness of the results of discrete choice experiments by focusing more on reliability and the validity of the discrete choice models. A growing number of studies compare the performance of discrete choice models between MNL and more flexible specifications, such as latent class model, nested logit, and random parameters and assess the performance and prediction accuracy. Future studies should include more flexible discrete choice models beyond MNL, which has been widely used in the hospitality and tourism literature, and provide the related results to increase the robustness of the studies. It may also consider estimating interaction effects of socio-demographic attributes in the choice model and including covariates in the latent class model. Through this procedure, we would know which discrete choice model performs better compared to MNL, depending on the sample characteristics (homogeneous versus heterogonous), sample size, and methods used.

5.4 Conclusions

The primary purpose of this study was to examine the differential effects that cognitive, affective, and sensory attributes have on consumer hotel choice. Through the discrete choice analysis process, this dissertation demonstrated the value of incorporating an experiential perspective into hotel choice modeling. For this purpose, I tested hypothesis 1 by using a log-likelihood ratio (LR) test based on MNL and RPL models. The results based on log-likelihood values and model fit measures showed that the addition of affective and sensory attributes into

the choice model better explained hotel choice compared to the model with only cognitive attributes. To understand hotel choice behavior, we should consider not only cognitive (e.g., price, service and food quality, brand name) attributes, but also affective (e.g., comfortable feelings and entertaining) and sensory (e.g., room quality and overall atmosphere) attributes.

The other purpose of this study was to identify the moderating effects of consumer choice context on the relationship between cognitive, affective, and sensory attributes and hotel choice. For this research objective, hypothesis 2 was tested based on MNL and RPL models. Among eight interaction effects, four interaction effects with the context -- price, comfortable, room quality, and atmosphere -- were statistically significant on hotel choice. Specifically, leisure travelers were more price-sensitive and influenced by overall atmosphere compared to business travelers. Business travelers put more emphasis on room quality and comfortable feelings than leisure travelers. The findings provide hotel managers with important insights and implications in terms of target segmentation, product development, and marketing communication strategy.

This study demonstrated the usefulness of choice modeling based on a Bayesian D-optimal design in hotel choice studies, instead of the existing multi-attribute methods rating the importance of attributes. To test hypotheses 1 and 2, two discrete choice models (MNL and RPL) were used and compared to check the validity of discrete choice analysis. Although there were small differences in the results, RPL outperformed MNL model in terms of model fit and explanatory power. Future study needs to consider not only MNL, but also more flexible models to improve the robustness of the obtained value.

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APPENDICES

Appendix A

Initial Pool of Attributes Based on Previous Research and In-depth Interviews

	Examples of attributes
Cognitive (functional) experience 20 attributes	value for money, location, responsiveness staff services, swimming pool, fitness center, business center, restaurant facilities (variety and quality), high speed internet access in room, loyalty program, brand name, check in check-out options, price, accessibility, reservation system, meeting facilities, reputation of hotel, availability of continental breakfast, network with personal relationship, discount, convenient parking, etc.
Affective (emotional) Experience 28 attributes	Comfortable, secure, welcome, relaxed, content, respected, practical, important, excited, pampered, entertained, elegant, sophisticated, inspired, extravagant, cool, cared for, valued, interested, energetic, happy, pleased, stimulated, trust, focused, privileged, satisfied, unique, etc.
Sensory (sensational) Experience 11 attributes	Visual(5): Interior(lighting, equipment, furnishing, and cleanliness), exterior (sign, symbol, and appearance), employee appearance, and scenery (view), cleanliness Smell (1): ambient scent (odor) Sound (2): music, noise (quietness) Touch (3): bed and pillow's comfort, temperature, and bath amenities (including bath towel and/or bath robe)

Appendix B

Attribute Pretest Questionnaire

Hotel Experience Study

Dear Respondents:

Thank you for participating in this study. The purpose of this research is to understand customer choice behavior and to examine what factors affect decision to choose a hotel. Your answers and the results of this study will be used for academic research purposes only.

Your help is important to the success of this study. Your participation in this study is entirely voluntary. Your answers will be strictly confidential and anonymous.

Please take about 10 to 15 minutes to complete and read all instructions and questions carefully. There are no right or wrong answers, so please try to answer all questions as openly and accurately as possible. If you have any questions about the study, feel free to contact the lead researcher, Dohee Kim, at dkim2@vt.edu. When you are done, please fill-in the name of the student who referred you to the survey, so he/she can receive extra credit.

Again, thank you for your time and participation!

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SECTION 1: RECENT HOTEL EXPERIENCE

<u>INSTRUCTION</u>: Please recall the hotel you visited most recently. In this section, please rate the items that describe how you assess your experience at a specific hotel.

1. What was the intended purpose of your most recent trip, where you stayed at a hotel? (check all that apply)

___ Visit American cities
___ Sightseeing tourist destinations
___ Beach and water sports
___ Cruises
___ Skiing/Snowboarding
___ Golfing/Tennis /Hiking
___ Visit foreign destinations
___ Visit family and friends at their homes
___ Business trip or conference
___ Business training
___ Other (Please specify) _____

2. What brand (or type of hotel) did you stay in during your most recent visit? *Please fill-in the specific hotel name*. (*For example, Courtyard by Marriott, Westin, Hilton, etc.)*

3. Have you ever stayed at this hotel brand (or type of hotel), prior to this visit?

___ No ___ Yes

(If yes, how many times?)

___ 1 ___ 3 ___ 5 ___ 7
___ 2 ___ 4 ___ 6 ___ 8 or more

4. How many nights did you stay at this hotel on this trip?

___ 1 ___ 5
___ 2 ___ 6
___ 3 ___ 7
___ 4 ___ 8 or more

5. Who selected the hotel for this recent trip?

___ Me
___ Family member (spouse, parents, etc.)
___ Friend or colleague
___ Organization (company, employer, etc.)
___ Other (Please specify) _____

6. Who accompanied you during your recent hotel visit? (check all that apply)

___ Family
___ Friend(s)
___ Organized group
___ Alone

___ Co-workers or colleagues
___ Other (Please specify) _____

7. **On your last hotel experience, how important were the following items to you**? (*Please indicate the level of importance to you, where 1=extremely unimportant, and 7=extremely important, by selecting the appropriate number)*

A. ***FEATURES/INFORMATION ABOUT THE HOTEL***

	Extremely Unimportant			**NEUTRAL**			**Extremely Important**
Value for money	1	2	3	4	5	6	7
Convenient location	1	2	3	4	5	6	7
Responsive staff (speed, efficiency)	1	2	3	4	5	6	7
Interpersonal service (wake-up)	1	2	3	4	5	6	7
Swimming pool	1	2	3	4	5	6	7
Business center	1	2	3	4	5	6	7
Variety of food choices	1	2	3	4	5	6	7
Food and beverage quality	1	2	3	4	5	6	7
High speed internet access in room	1	2	3	4	5	6	7
Loyalty program	1	2	3	4	5	6	7
Brand name	1	2	3	4	5	6	7
Check-in/Check-out options	1	2	3	4	5	6	7
Price	1	2	3	4	5	6	7
Reservation system	1	2	3	4	5	6	7
Meeting facilities	1	2	3	4	5	6	7
Reputation of hotel	1	2	3	4	5	6	7
Availability of continental breakfast	1	2	3	4	5	6	7
Convenient parking	1	2	3	4	5	6	7
Health/Fitness facilities	1	2	3	4	5	6	7

Please read each of the following adjectives carefully and indicate **how important they are to your experience with the hotel.**

B. ***HOW YOU FEEL WHEN AT THE HOTEL***

	Extremely Unimportant			**NEUTRAL**			**Extremely Important**
Excited	1	2	3	4	5	6	7
Surprised	1	2	3	4	5	6	7
Cared for	1	2	3	4	5	6	7
Valued	1	2	3	4	5	6	7
Sophisticated	1	2	3	4	5	6	7
Interested	1	2	3	4	5	6	7
Privileged	1	2	3	4	5	6	7
Thrilled	1	2	3	4	5	6	7
Grateful	1	2	3	4	5	6	7

Entertained	1	2	3	4	5	6	7
Enthusiastic	1	2	3	4	5	6	7
Pampered	1	2	3	4	5	6	7
Comfortable	1	2	3	4	5	6	7
Contented	1	2	3	4	5	6	7
Friendly	1	2	3	4	5	6	7
Relaxed	1	2	3	4	5	6	7
Pleased	1	2	3	4	5	6	7
Respected	1	2	3	4	5	6	7
Happy	1	2	3	4	5	6	7
Fulfilled	1	2	3	4	5	6	7
Warm-hearted	1	2	3	4	5	6	7
Welcoming	1	2	3	4	5	6	7
Secure	1	2	3	4	5	6	7
Peaceful	1	2	3	4	5	6	7

C. YOUR REACTION TO THE HOTEL (SENSATIONS INDUCED DURING THE EXPERIENCE)

	Extremely Unimportant			**NEUTRAL**			**Extremely Important**
(VISUAL)							
Cleanliness of room	1	2	3	4	5	6	7
Hotel Interior (furnishings)	1	2	3	4	5	6	7
Hotel exterior	1	2	3	4	5	6	7
(SMELL)							
Aroma/Scent	1	2	3	4	5	6	7
(SOUND)							
Music	1	2	3	4	5	6	7
Quietness	1	2	3	4	5	6	7
(TOUCH)							
Comfort of bed and pillow	1	2	3	4	5	6	7
Temperature of room	1	2	3	4	5	6	7
Bathroom amenities (Towels)	1	2	3	4	5	6	7

9. Hotel stays can be evaluated in terms of three perspectives, cognitive, affective, and sensory experiences. Overall, how do you evaluate your hotel experience during the previous hotel stay?

	STRONGLY DISSATISFIED						**STRONGLY SATISFIED**
Cognitive experience (**Hotel features**: location, price, brand name, food & beverage, etc.)	1	2	3	4	5	6	7
Affective experience (**Personal feelings**: welcoming, relaxed, pampered, entertained, etc.)	1	2	3	4	5	6	7
Sensory experience (**Hotel experience**: Interior, exterior, temperature, etc.)	1	2	3	4	5	6	7
Overall experience	1	2	3	4	5	6	7

10. How likely is it that you would revisit to this hotel brand or type of hotel (e.g. independent hotel) in the future?

MOST UNLIKELY						**MOST LIKELY**
1	2	3	4	5	6	7

11. How likely would you be to have a strong intention to bring your family and friends to visit hotel brand or type of hotel (e.g. independent hotel) again?

MOST UNLIKELY						**MOST LIKELY**
1	2	3	4	5	6	7

12. How likely would you be to consider this hotel brand or type of hotel (e.g. independent hotel) as your first choice over other hotels?

MOST UNLIKELY						**MOST LIKELY**
1	2	3	4	5	6	7

SECTION 2: TRAVEL PURPOSE

13. What was the purpose for your recent stay in a hotel? *(Please check one)*

___Leisure (**go to 14~16** and skip 17~21, **Continue to Section 3**)
___Business (**go to 17~21, Continue to Section 3**)
___Business and leisure (e.g. conference or business trip with family)
(**go to 17~21, Continue to Section 3**)
___ Other (Please specify) _____

(LEISURE) 14. What was your specific purpose of recent leisure travel?

___ Vacation
___ Visiting family and friends
___ Recreational activities (e.g. ski, golf, hiking, etc.)
___ Family events (e.g. wedding, funeral, etc.)
___ Other (Please specify) _____

(LEISURE) 15. How many leisure travel vacations (overnight) have you taken in the last 12 months?

___ None
___ 1
___ 2
___ 3
___ 4
___ 5
___ 6
___ 7
___ 8 or mor

(LEISURE) 16. Using the scale below, please indicate the likelihood that you will take a leisure trip in the next year.

NOT VERT LIKELY						**VERY LIKELY**
1	2	3	4	5	6	7

(BUSINESS) 17. What was your specific purpose of recent business travel?
___Business trip (e.g. sales)
___Convention or conference
___Interview(s)
___Business training
___ Other (Please specify) _____

(BUSINESS) 18. How many business trips (overnight) have you taken in the last 12 months?
___ None ___ 4 ___ 8
___ 1 ___ 5 ___ 9
___ 2 ___ 6 ___ 10
___ 3 ___ 7 ___ 11 or more

(BUSINESS) 19. Using the scale below, please indicate the likelihood that you will take a business trip in the next year.

NOT VERT LIKELY **VERY LIKELY**
1 2 3 4 5 6 7

(BUSINESS) 20. Who paid for your recent hotel expenses?
___Organization (e.g. company, owner, etc.) that provides an unlimited business travel budget
___ Organization (e.g. university, company, etc.) that provides a limited business travel budget
___My own business expenses (e.g. business owners)
___Other (Please specify) _____

(BUSINESS) 21. Have you taken your family along on a business trip within the last 12 months?

___ No ___ Yes
(If yes, how many times?)
___ 1 ___ 3 ___ 5 ___ 7
___ 2 ___ 4 ___ 6 ___ 8 or more

SECTION 3: PERSONAL INFORMATION (All of your answers are **completely confidential**.

22. What is your gender? ____ Female____ Male

23. What is your age?
_____ Under 21 _____51-60
_____21-30 _____61-70
_____31-40 _____Over 70
_____41-50

24. What is your approximate yearly household income before taxes?
___ $0 - $24,999 ___ $100,000 - $149,999 ___$300,000 or more
___ $25,000 - $49,999 ___ $150,000 - $199,999

___ $50,000 - $74,999
___ $75,000 - $99,999
___ $200,000 - $249,999
___ $250,000 - $299,99

25. What is your ethnic background?
___ African American
___Asian
___Hispanic
___Caucasian/White
___Other (Please specify)_____

26. What is your highest level of education?
___ Less than high school degree
___ High school degree
___ Some college
___ College graduate
___ Graduate degree

Comments and Suggestions

Please share any other comments you might have about choosing a hotel for a vacation and/or a business trip. Please fill-in the name of the student who referred you, so he/she can receive extra credit.

THANK YOU VERY MUCH FOR YOUR TIME AND ASSISTANCE ON THIS STUDY.

Appendix C

Pilot Test Questionnaire (Leisure Context)

Hotel Choice Study

Dear Respondents:

Thank you for participating in this study. The purpose of this research is to understand customer behavior when selecting a hotel and to identify and examine the factors that affect decision to choose a hotel. Your answers and the results of this study will be used for academic research purposes only.

Your help is important to the success of this study. Your participation in this study is entirely voluntary. Your answers will be strictly confidential and anonymous.

Please take about 15 minutes to complete and read all instructions and questions carefully. There are no right or wrong answers, so please try to answer all questions as openly and accurately as possible. If you have any questions about the study, feel free to contact the lead researcher, Dohee Kim, by email at dkim2@vt.edu or at (540) 250-0786.

Again, thank you for your time and participation!

Researcher: Dohee Kim

Ph. D. Candidate

Hospitality and Tourism Management

Virginia Tech

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I. Your recent hotel experience

<u>INSTRUCTION</u>: Please recall the hotel you visited most recently. In this section, please answer the items that describe how you assess your experience at a specific hotel.

1. Have you traveled to any destination and stayed in a hotel more than one night for leisure purpose in the past 24 months?
   ___ Yes ___ No (Please stop here)

2. How many leisure travel vacations (overnight) have you taken in the last 24 months?
   _____ times

3. What was the specific purpose for your most recent stay in a hotel? *(Please check one)*
   ___ Vacation___ Visiting family and friends

   ___ Recreational activities ___ Family events (e.g. wedding, funeral, etc.)

   ___ Business trip (e.g. sales) __Convention or conference

   ___Interview(s) ___Business training

   ___ Other (Please specify)_____

4. What brand (or type) of hotel did you stay in during your most recent visit? *Please fill-in the specific hotel name*. (*For example, Courtyard by Marriott, Westin, Hilton, etc.)*

   _____

5. Had you ever stayed at this hotel brand (or type of hotel), prior to this visit?
   ___ No ___ Yes
   If yes, how many times?
   ___ 1 ___ 3 ___ 5 ___ 7
   ___ 2 ___ 4 ___ 6 ___ 8 or more

6. Who accompanied you during your recent hotel visit? (check all that apply)

   ___ Alone ___ Spouse/Partner ___ Family members ___ Friend(s)

   ___ Organized tour ___ Co-workers or colleagues

   ___ Other (Please specify) _____

7. Who paid your hotel expenses incurred during this trip?

   ___ I did ___ I shared expenses with other people in the group I travelled with

   ___ My organization (e.g. company) provides travel budget

   ___Other (Please specify) _____

8. Using the scale below, please indicate the likelihood that you will take a leisure trip this year.

NOT VERY LIKELY					**VERY LIKELY**	
1	2	3	4	5	6	7

- Instructions: before evaluating the scenarios, please check the definitions of the levels carefully.

Features/Characteristics	No. of Levels	Specific Levels	Definition of levels
1. Price	3	$ $$$ $$$$$	$ Economy $$$ Mid-range $$$$$ Upscale
2. Service & Food Quality	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic service without on-site restaurants 3 Star: Good service with room service and dining service on-site 5 Star: High quality service hotel (including personalized service) with excellent restaurants, fine dining, bars, lounge, and room service
3. National, recognized brand	2	Yes No	Yes: Well-known, national hotel brand No: Local independent hotel
4. Sports facilities (e.g. pool, fitness center)	2	★★★☆☆ ★★★★★	3 Star: On-site sport facility, not necessarily high quality 5 Star: A high quality sport facility with the latest gym equipment and well-maintained pool
5. Comfortable (e.g. welcoming, friendly, relaxed, secure, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	l Star: Not comfortable 3 Star: Comfortable 5 Star: Exceptionally comfortable
6. Entertaining (e.g. excited about lounge & bar, show, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Not entertaining 3 Star: Entertaining (e.g. lounge and bar, show) 5 Star: Very entertaining (e.g. show, casino, children's program)
7. Room quality (e.g. cleanliness, comfortable bed, quiet, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic quality room 3 Star: A good quality room 5 Star: A high quality well-adorned room with high quality bedding and furnishings
8. Overall atmosphere (ambience) (e.g. music, interior, exterior)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Casual ambience with basic and simple functions 3 Star: Modern, but not necessarily luxurious ambience 5 Star: The very best and most luxurious Ambience

II. Choice scenarios for leisure travel context

Imagine a situation where you are taking a family vacation to Orlando for four days to visit Disney theme parks at your own expense. Assume that your travel party includes two adults, including yourself, and two children. Also, assume that two hotels with adjacent parking lots are located in the same area within 1 mile of each other. Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

1. Which of these two hotels would you choose for your vacation?

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★★★☆☆	
National, recognized brand	Yes	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

2. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand	Yes	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

3. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$	$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

4. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★	★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

5. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand Sports facility	No	No	
(e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

6. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★☆☆	★☆☆☆☆	
National, recognized brand Sports facility (e.g. pool, fitness center)	No ★★★☆☆	Yes ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

7. Which of these two hotels would you choose for your business trip?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. Music, exterior, interior)	★★★★★	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

8. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★☆☆☆☆	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★☆☆☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

9. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★☆☆☆☆	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★☆☆	No ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

III. Demographic information (All of your answers are completely confidential.)

1. What is your gender? ____ Male ____ Female

2. What is your age? _____ years

3. Your zip code: _____

4. Your marital status: ___ Single (Never Married) ___ Living with Spouse/Partner

___ Widowed ___ Separated ___ Divorced

5. What is your ethnic background?

___ African American/Black ___Asian

___ Hispanic ___Caucasian/White

___ Native American ___Other (Please specify) _____

6. What is your highest level of education?

___ Less than high school degree ___ High school degree

___ Some college /Technical school ___ College degree

___ Graduate degree

7. What is your approximate yearly household income before taxes?

___ $0 - $24,999	___ $100,000 - $149,999	___$300,000 or more
___ $25,000 - $49,999	___ $150,000 - $199,999	
___ $50,000 - $74,999	___ $200,000 - $249,999	
___ $75,000 - $99,999	___ $250,000 - $299,999	

Comments and Suggestions

Please share any additional comments you have about or for this survey (e.g. the number of choice scenarios, the understanding choice context, the length, and time to complete, etc.)

THANK YOU VERY MUCH FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE.

Appendix D

Pilot Test Questionnaire (Business Context)

Hotel Choice Study

Dear Respondents:

Thank you for participating in this study. The purpose of this research is to understand customer choice when selecting a hotel and to identify and examine the factors that affect decision to choose a hotel. Your answers and the results of this study will be used for academic research purposes only.

Your help is important to the success of this study. Your participation in this study is entirely voluntary. Your answers will be strictly confidential and anonymous.

Please take about 15 minutes to complete and read all instructions and questions carefully. There are no right or wrong answers, so please try to answer all questions as openly and accurately as possible. If you have any questions about the study, feel free to contact the lead researcher, Dohee Kim, by email at dkim2@vt.edu or at (540) 250-0786.

Again, thank you for your time and participation!

Researcher: Dohee Kim

Ph. D. Candidate

Hospitality and Tourism Management

Virginia Tech

dkim2@vt.edu

I. Your recent hotel experience

<u>INSTRUCTION</u>: Please recall the hotel you visited most recently. In this section, please answer the items that describe how you assess your experience at a specific hotel.

1. Have you traveled to any destination and stayed in a hotel more than one night for business purpose in the past 24 months?
   ___ Yes ___ No (Please stop here)

2. How many business trip (overnight) have you taken in the last 24 months?
   _____ times

3. What was the specific purpose for your most recent stay in a hotel? *(Please check one)*
   ___ Vacation___ Visiting family and friends

   ___ Recreational activities ___ Family events (e.g. wedding, funeral, etc.)

   ___ Business trip (e.g. sales) __Convention or conference

   ___Interview(s) ___Business training

   ___ Other (Please specify)_____

4. What brand (or type) of hotel did you stay in during your most recent visit? *Please fill-in the specific hotel name*. (*For example, Courtyard by Marriott, Westin, Hilton, etc.)*
   _____

5. Had you ever stayed at this hotel brand (or type of hotel), prior to this visit?
   ___ No ___ Yes
   If yes, how many times?
   ___ 1 ___ 3 ___ 5 ___ 7
   ___ 2 ___ 4 ___ 6 ___ 8 or more

6. Who accompanied you during your recent hotel visit? (check all that apply)

   ___ Alone ___ Spouse/Partner ___ Family members ___ Friend(s)

   ___ Organized tour ___ Co-workers or colleagues

   ___ Other (Please specify)_____

7. Who paid your hotel expenses incurred during this trip?

   ___ I did ___ I shared expenses with other people in the group I travelled with

   ___ My organization (e.g. company) provides travel budget

   ___Other (Please specify) _____

8. Using the scale below, please indicate the likelihood that you will take a business trip this year.

   NOT VERT LIKELY **VERY LIKELY**
   2 2 3 4 5 6 7

- Instructions: before evaluating the scenarios, please check the definitions of the levels carefully.

Features/Characteristics	No. of Levels	Specific Levels	Definition of levels
1. Price	3	$ $$$ $$$$$	$ Economy $$$ Mid-range $$$$$ Upscale
2. Service & Food Quality	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic service without on-site restaurants 3 Star: Good service with room service and dining service on-site 5 Star: High quality service hotel (including personalized service) with excellent restaurants, fine dining, bars, lounge, and room service
3. National, recognized brand	2	Yes No	Yes: Well-known, national hotel brand No: Local independent hotel
4. Sports facilities (e.g. pool, fitness center)	2	★★★☆☆ ★★★★★	3 Star: On-site sport facility, not necessarily high quality 5 Star: A high quality sport facility with the latest gym equipment and well-maintained pool
5. Comfortable (e.g. welcoming, friendly, relaxed, secure, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	l Star: Not comfortable 3 Star: Comfortable 5 Star: Exceptionally comfortable
6. Entertaining (e.g. excited about lounge & bar, show, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Not entertaining 3 Star: Entertaining (e.g. lounge and bar, show) 5 Star: Very entertaining (e.g. show, casino, children's program)
7. Room quality (e.g. cleanliness, comfortable bed, quiet, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic quality room 3 Star: A good quality room 5 Star: A high quality well-adorned room with high quality bedding and furnishings
8. Overall atmosphere (ambience) (e.g. music, interior, exterior)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Casual ambience with basic and simple functions 3 Star: Modern, but not necessarily luxurious ambience 5 Star: The very best and most luxurious Ambience

II. Choice scenarios for business travel context

Imagine a situation where you are taking a business trip by yourself to Chicago for three days. In this business context, business travel means **sales trip (or corporate meeting)**. Your company or organization is providing your business travel budget. Assume that two hotels with adjacent parking lots are located in the same area within 1 mile of each other and near your meeting place. Please consider the following scenarios and choose the hotel that you would select for your business trip.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

1. Which of these two hotels would you choose for your vacation?

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★★★☆☆	
National, recognized brand	Yes	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

2. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand	Yes	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

3. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$	$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

4. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation.

Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★	★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

5. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand Sports facility	No	No	
(e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

6. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★☆☆	★☆☆☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

7. Which of these two hotels would you choose for your business trip?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$$$	$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. Music, exterior, interior)	★★★★★	★★★☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

8. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$$$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★☆☆☆☆	★☆☆☆☆	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★☆☆☆☆	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

9. Which of these two hotels would you choose for your vacation?

Please consider the following scenarios and choose the hotel that you would select for your vacation. Note: we have highlighted in gray those features that are the same for both hotels A and B.

Choice criteria	Hotel A	Hotel B	Neither of them
Price	$	$$$$$	I would not choose either hotel if these are my only choices
Service & Food quality	★★★★★	★☆☆☆☆	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★☆☆	No ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★★★	
I would choose (Check only one)	☐ Hotel A	☐ Hotel B	☐ Neither

III. Demographic information (All of your answers are completely confidential.)

1. What is your gender? ____ Male ____ Female

8. What is your age? _____ years

9. Your zip code: _____

10. Your marital status: ___ Single (Never Married) ___ Living with Spouse/Partner

___ Widowed ___ Separated ___ Divorced

11. What is your ethnic background?

___ African American/Black ___Asian

___Hispanic ___Caucasian/White

___ Native American ___Other (Please specify) _____

12. What is your highest level of education?

___ Less than high school degree ___ High school degree

___ Some college /Technical school ___ College degree

___ Graduate degree

13. What is your approximate yearly household income before taxes?

___ $0 - $24,999	___ $100,000 - $149,999	___$300,000 or more
___ $25,000 - $49,999	___ $150,000 - $199,999	
___ $50,000 - $74,999	___ $200,000 - $249,999	
___ $75,000 - $99,999	___ $250,000 - $299,999	

Comments and Suggestions

Please share any additional comments you have about or for this survey (e.g. the number of choice scenarios, the understanding choice context, the length, and time to complete, etc.)

THANK YOU VERY MUCH FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE.

Appendix E

Main Questionnaire A (Leisure Context)

Hotel Choice Study

Dear Respondents:

Thank you for participating in this study. The purpose of this research is to understand customer behavior when selecting a hotel for **a leisure vacation trip**. Your answers and the results of this study will be used for academic research purposes only.

Your help is important to my success as a Ph.D. student. While your participation in this study is entirely voluntary, please take the time to complete this short questionnaire and help me complete my dissertation. Your answers will be strictly confidential and anonymous.

Please take about **15 minutes** to read the instructions and answer the questions carefully. There are no incorrect answers, so please try to answer each question as openly as possible and tell me how you would choose a hotel. If you have any questions about the study, feel free to contact me by email at dkim2@vt.edu or at (540) 250-0786.

If you need any help, please email at survey@zoompanel.com (Help Link).

Again, thank you for your time and participation!

Dohee Kim

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I. Your Recent Hotel Experience

<u>INSTRUCTION</u>: Please recall the hotel you visited most recently. In this section, please answer the items that describe how you assess your experience at a specific hotel.

1. Have you traveled to any destination and stayed in a hotel more than one night for leisure purpose in the past 12 months?
   ___ Yes ___ No (Please stop here)

2. How many times have you stayed overnight in a hotel for leisure travel in the last 12 months?

   _____ times

3. What was the specific purpose for your most recent stay in a hotel? *(Please check one)*
   ___ Vacation or leisure

   ___ Business or convention

   ___ Family events (e.g. wedding, funeral, etc.)

   ___ Other (Please specify)_____

4. What brand (or type) of hotel did you stay in during your most recent stay? *Please fill-in the specific hotel name*. (*For example, Courtyard by Marriott, Westin, Hilton, name of a local independent hotel, etc.)*

   _____

5. Had you ever stayed at this hotel brand (or type of hotel), prior to this visit?
   ___ No ___ Yes
   If yes, how many times in the last 24 months?
   ___ 1 ___ 3 ___ 5 ___ 7
   ___ 2 ___ 4 ___ 6 ___ 8 or more

6. Using the scale below, please indicate the likelihood that you will take a leisure trip in the next 12 months.
   NOT VERT LIKELY **VERY LIKELY**
   1 2 3 4 5 6 7

II. Hotel Choice Instructions

In the following pages, we present sixteen choice sets of hotels. There are two hotels in each set to be compared against each other. For each set, please evaluate the two hotels and answer the following question:

Which of these two hotels would you choose for your vacation?

For each set of hotels that we would like you compare, please consider eight attributes that are defined in the table below: *price; service & food quality; national, recognized brand; sports facility; comfortable; entertaining; room quality; and atmosphere*.

Before proceeding to the sets of hotels, please review the table and check the definition of each level carefully before evaluating the sets of hotels.

Table. Features/Characteristics and Definitions of Levels

Features/Characteristics	No. of Levels	Specific Levels	Definition of levels
1. Price	3	$ $$$ $$$$$	$ Economy $$$ Mid-range $$$$$ Upscale
2.Service & Food Quality	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic service without on-site restaurants 3 Star: Good service with room service and dining service on-site 5 Star: High quality service hotel (including personalized service) with excellent restaurants, fine dining, bars, lounge, and room service
3. National, recognized brand	2	Yes No	Yes: Well-known, national hotel brand No: Local independent hotel
4. Sports facilities (e.g. pool, fitness center)	2	★★★☆☆ ★★★★★	3 Star: On-site sport facility, not necessarily high quality 5 Star: A high quality sport facility with the latest gym equipment and well-maintained pool
5. Comfortable (e.g. welcoming, friendly, relaxed, secure, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	l Star: Not comfortable 3 Star: Comfortable 5 Star: Exceptionally comfortable
6. Entertaining (e.g. excited about lounge	3	★☆☆☆☆ ★★★☆☆	1 Star: Not entertaining 3 Star: Entertaining (e.g. lounge and bar,

& bar, show, etc.)		★★★★★	show) 5 Star: Very entertaining (e.g. show, casino, children's program)
7. Room quality (e.g. cleanliness, comfortable bed, quiet, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic quality room 3 Star: A good quality room 5 Star: A high quality well-adorned room with high quality bedding and furnishings
8. Overall atmosphere (ambience) (e.g. music, interior, exterior)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Casual ambience with basic and simple functions 3 Star: Modern, but not necessarily luxurious ambience 5 Star: The very best and most luxurious Ambience

III. Choice Sets of Hotels to consider for Leisure Travel

In the next section, we present the nine sets of hotels. Please compare each set of hotels as if you were choosing a hotel for your vacation travel.

As you consider each set of hotels, imagine that you are taking **a family vacation to Orlando for four days** to visit Disney theme parks **at your own expense**. Assume that your travel party includes two adults, including yourself, and two children. Also, assume that the two hotels have adjacent parking lots and are located within 1 mile of each other.

Choose the hotel in each set that you would select for your vacation. If you wouldn't choose either of the two hotels, please select "Neither". As you consider each set of hotels, please think about the set without considering the hotels described in the previous sets or the choices you made for those sets.

1. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$ (Mid-range)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	Yes ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

2. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$$$$$ (Upscale) ★★★☆☆ No ★★★★★	$$$ (Mid-range) ★☆☆☆☆ Yes ★★★★★	Neither. I would not choose either hotel.
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆ ★☆☆☆☆	★★★☆☆ ★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★ ★★★☆☆	★★★★★ ★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

3. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$$$ (Mid-range)	
Service & Food quality	★☆☆☆☆	★☆☆☆☆	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

4. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	No ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

5. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$$$ (Upscale)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★☆☆	
National, recognized brand Sports facility (e.g. pool, fitness center)	No ★★★☆☆	Yes ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

6. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$ (Economy)	
Service & Food quality	★★★★★	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	No ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

7. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	Neither. I would not choose either hotel.
Service & Food quality	★☆☆☆☆	★★★★★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. Music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

8. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★★★	★☆☆☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

9. Which of these two hotels would you choose for your vacation? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★☆☆☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

10. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	Neither. I would not choose either hotel.
Service & Food quality	★☆☆☆☆	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	No ★★★☆☆	Yes ★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	◯	◯	◯

11. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$$$ (Mid-range) ★★★☆☆ No ★★★★★	$$$ (Mid-range) ★★★★★ Yes ★★★☆☆	Neither. I would not choose either hotel.
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆ ★★★☆☆	★☆☆☆☆ ★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆ ★★★★★	★★★☆☆ ★★★☆☆	
I would choose (Check only one)	◯	◯	◯

12. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$ (Economy) ★★★☆☆ Yes ★☆☆☆☆	$(Economy) ★★★★★ No ★☆☆☆☆	
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆ ★★★☆☆	★☆☆☆☆ ★★★★★	Neither. I would not choose either hotel.
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆ ★★★☆☆	★☆☆☆☆ ★★★☆☆	
I would choose (Check only one)	◯	◯	◯

13. Which of these two hotels would you choose for your vacation? Please select the circle at the **bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$$$$$ (Upscale) ★★★☆☆ No ★★★★★	$ (Economy) ★★★☆☆ Yes ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆ ★★★★★	★☆☆☆☆ ★★★★★	Neither. I would not choose either hotel.
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★ ★☆☆☆☆	★★★☆☆ ★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

14. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$ (Economy) ★★★☆☆ No ★★★☆☆	$ (Economy) ★★★★★ Yes ★★★★★	Neither. I would not choose either hotel.
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆ ★★★★★	★★★★★ ★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆ ★☆☆☆☆	★☆☆☆☆ ★★★☆☆	
I would choose (Check only one)	◯	◯	◯

15. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$$$ (Mid-range)	
Service & Food quality	★★★★★	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	Yes ★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

16. Which of these two hotels would you choose **for your vacation**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★☆☆	Yes ★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	◯	◯	◯

III. Demographic information (All of your answers are completely confidential.)

1. What is your gender? ____ Male ____ Female

7. What is your age? _____ years

8. Your zip code: _____

9. Your marital status: ___ Single ___ Separated
___ Married ___ Divorced
___ Widowed

10. What is your ethnic background?
___ African American/Black ___Caucasian/White
___Asia ___ Native American
___ Hispanic ___Other (Please specify) _____

11. What is your highest level of education?
___ Less than high school degree ___ College degree
___ High school degree ___ Graduate degree
___ Some college /Technical school

12. What is your approximate yearly household income before taxes?

___ $0 - $24,999
___ $25,000 - $49,999
___ $50,000 - $74,999
___ $75,000 - $99,999
___ $100,000 - $149,999
___ $150,000 - $199,999
___ $200,000 - $249,999
___ $250,000 - $299,999
___$300,000 or more
___ No response

Comments and Suggestions

Please share any additional comments you might have about choosing a hotel for a vacation travel or about this survey (e.g. factors that influence hotel decisions, the number of hotel sets, etc.)

THANK YOU VERY MUCH FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE.

Appendix F

Main Questionnaire B (Business Context)

Hotel Choice Study

Dear Respondents:

Thank you for participating in this study. The purpose of this research is to understand customer behavior when selecting a hotel for **a business trip**. Your answers and the results of this study will be used for academic research purposes only.

Your help is important to my success as a Ph.D. student. While your participation in this study is entirely voluntary, please take the time to complete this short questionnaire and help me complete my dissertation. Your answers will be strictly confidential and anonymous.

Please take about **15 minutes** to read the instructions and answer the questions carefully. There are no incorrect answers, so please try to answer each question as openly as possible and tell me how you would choose a hotel. If you have any questions about the study, feel free to contact me by email at dkim2@vt.edu or at (540) 250-0786.

If you need any help, please email at survey@zoompanel.com (Help Link).

Again, thank you for your time and participation!

Dohee Kim

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Hospitality and Tourism Management

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I. Your Recent Hotel Experience

<u>INSTRUCTION</u>: Please recall the hotel you visited most recently. In this section, please answer the items that describe how you assess your experience at a specific hotel.

1. Have you traveled to any destination and stayed in a hotel more than one night for business purpose in the past 12 months?

   ___ Yes ___ No (Please stop here)

2. How many times have you stayed overnight in a hotel for business trip in the last 12 months?
   _____ times

3. What was the specific purpose for your most recent stay in a hotel? *(Please check one)*
   ___ Vacation or Leisure

   ___ Business or Convention

   ___ Family events (e.g. wedding, funeral, etc.)

   ___ Other (Please specify)_____

4. What brand (or type) of hotel did you stay in during your most recent stay? *Please fill-in the specific hotel name*. (*For example, Courtyard by Marriott, Westin, Hilton, name of a local independent hotel, etc.)*

   _____

5. Had you ever stayed at this hotel brand (or type of hotel), prior to this visit?
   ___ No ___ Yes
   If yes, how many times in the last 24 months?
   ___ 1 ___ 3 ___ 5 ___ 7
   ___ 2 ___ 4 ___ 6 ___ 8 or more

6. Using the scale below, please indicate the likelihood that you will take a business trip in the next 12 months.

NOT VERT LIKELY						**VERY LIKEL**
1	2	3	4	5	6	7

II. Hotel Choice Instructions

In the following pages, we present sixteen sets of hotels. There are two hotels in each set to be compared against each other. For each set, please evaluate the two hotels and answer the following question:

Which of these two hotels would you choose for business trip?

For each set of hotels that we would like you compare, please consider eight attributes that are defined in the table below: *price; service & food quality; national, recognized brand; sports facility; comfortable; entertaining; room quality; and atmosphere*.

Before proceeding to the sets of hotels, please review the table and check the definition of each level carefully before evaluating the sets of hotels.

Table. Features/Characteristics and Definitions of Levels

Features/Characteristics	No. of Levels	Specific Levels	Definition of levels
1. Price	3	$ $$$ $$$$$	$ Economy $$$ Mid-range $$$$$ Upscale
2.Service & Food Quality	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic service without on-site restaurants 3 Star: Good service with room service and dining service on-site 5 Star: High quality service hotel (including personalized service) with excellent restaurants, fine dining, bars, lounge, and room service
3.National, recognized brand	2	Yes No	Yes: Well-known, national hotel brand No: Local independent hotel
4.Sports facilities (e.g. pool, fitness center)	2	★★★☆☆ ★★★★★	3 Star: On-site sport facility, not necessarily high quality 5 Star: A high quality sport facility with the latest gym equipment and well-maintained pool
5. Comfortable (e.g. welcoming, friendly, relaxed, secure, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	l Star: Not comfortable 3 Star: Comfortable 5 Star: Exceptionally comfortable
6. Entertaining (e.g. excited about lounge	3	★☆☆☆☆ ★★★☆☆	1 Star: Not entertaining 3 Star: Entertaining (e.g. lounge and bar, show)

& bar, show, etc.)		★★★★★	5 Star: Very entertaining (e.g. show, casino, children's program)
7. Room quality (e.g. cleanliness, comfortable bed, quiet, etc.)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Basic quality room 3 Star: A good quality room 5 Star: A high quality well-adorned room with high quality bedding and furnishings
8. Overall atmosphere (ambience) (e.g. music, interior, exterior)	3	★☆☆☆☆ ★★★☆☆ ★★★★★	1 Star: Casual ambience with basic and simple functions 3 Star: Modern, but not necessarily luxurious ambience 5 Star: The very best and most luxurious ambience

III. Choice Sets of hotels to consider for business travel

In the next section, we present the sixteen sets of hotels. Please compare each set of hotels as if you were choosing a hotel for your business trip.

As you consider each set of hotels, imagine that you are taking a business trip by yourself to Chicago for three days. In this context, business travel means **sales trip or corporate meeting**. Your company or organization is providing your business travel budget. Assume that the two hotels have adjacent parking lots and are located within 1 mile of each other and near your meeting place.

Choose the hotel in each set that you would select for your business trip. If you wouldn't choose either of the hotels, please select "Neither". As you consider each set of hotels, please think about the set without considering the hotels described in the previous sets or the choices you made for those sets.

1. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price Service & Food quality National, recognized brand Sports facility (e.g. pool, fitness center)	$$$ (Mid-range) ★★★☆☆ Yes ★★★★★	$$$ (Mid-range) ★★★★★ Yes ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure) Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆ ★★★☆☆	★☆☆☆☆ ★★★☆☆	Neither. I would not choose either hotel.
Room quality (e.g. quiet, temperature, comfortable bed) Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆ ★★★☆☆	★★★★★ ★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

2. Which of these two hotels would you choose for **your business trip**? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$$$ (Upscale)	$$$ (Mid-range)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★☆☆☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

3. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$$$ (Mid-range)	
Service & Food quality	★☆☆☆☆	★☆☆☆☆	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

4. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★★★	★★★☆☆	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

5. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$$$ (Upscale)	$ (Economy)	
Service & Food quality	★★★☆☆	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★★★	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

6. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$ (Economy)	
Service & Food quality	★★★★★	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	No ★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

7. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	Neither. I would not choose either hotel.
Service & Food quality	★☆☆☆☆	★★★★★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. Music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

8. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★★★	★☆☆☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

9. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	Yes ★★★★★	No ★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★☆☆☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

10. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$$$ (Upscale)	Neither. I would not choose either hotel.
Service & Food quality	★☆☆☆☆	★★★★★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★★★	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	◯	◯	◯

11. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$$$ (Mid-range)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

12. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand	Yes	No	
Sports facility (e.g. pool, fitness center)	★☆☆☆☆	★☆☆☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★☆☆☆☆	
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

13. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$$$ (Upscale)	$ (Economy)	
Service & Food quality	★★★☆☆	★★★☆☆	
National, recognized brand	No	Yes	
Sports facility (e.g. pool, fitness center)	★★★★★	★★★☆☆	
Comfortable (e.g. welcoming, relaxed, secure)	★★★☆☆	★☆☆☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★★★	★★★☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★☆☆☆☆	
I would choose (Check only one)	◯	◯	◯

14. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$ (Economy)	Neither. I would not choose either hotel.
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand Sports facility (e.g. pool, fitness center)	No ★★★☆☆	Yes ★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★★★	
Entertaining (e.g. excited about lounge, bar, show)	★★★★★	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

15. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$ (Economy)	$$$ (Mid-range)	
Service & Food quality	★★★★★	★★★★★	
National, recognized brand Sports facility	Yes	Yes	
(e.g. pool, fitness center)	★★★★★	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★☆☆☆☆	★★★☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★☆☆☆☆	★★★★★	
Room quality (e.g. quiet, temperature, comfortable bed)	★★★☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★☆☆☆☆	★★★☆☆	
I would choose (Check only one)	◯	◯	◯

16. Which of these two hotels would you choose for your business trip? **Please select the circle at the bottom that indicates whether you prefer Hotel A, Hotel B, or Neither.**

Price	$$$ (Mid-range)	$ (Economy)	
Service & Food quality	★★★☆☆	★★★★★	
National, recognized brand	Yes	Yes	
Sports facility (e.g. pool, fitness center)	★★★☆☆	★★★★★	
Comfortable (e.g. welcoming, relaxed, secure)	★★★★★	★★★☆☆	Neither. I would not choose either hotel.
Entertaining (e.g. excited about lounge, bar, show)	★★★☆☆	★☆☆☆☆	
Room quality (e.g. quiet, temperature, comfortable bed)	★☆☆☆☆	★☆☆☆☆	
Overall hotel atmosphere (e.g. music, exterior, interior)	★★★★★	★★★★★	
I would choose (Check only one)	◯	◯	◯

III. Demographic information (All of your answers are completely confidential.)

1. What is your gender? ____ Male ____ Female

2. What is your age? _____ years

3. Your zip code: _____

4. Your marital status: ___ Single ___ Separated
___ Married ___ Divorced
___ Widowed

5. What is your ethnic background?
___ African American/Black ___Caucasian/White
___Asia ___ Native American
___ Hispanic ___Other (Please specify) _____

6. What is your highest level of education?
___ Less than high school degree ___ College degree
___ High school degree ___ Graduate degree
___ Some college /Technical school

7. What is your approximate yearly household income before taxes?

___ $0 - $24,999	___ $100,000 - $149,999	___$300,000 or more
___ $25,000 - $49,999	___ $150,000 - $199,999	___ No response
___ $50,000 - $74,999	___ $200,000 - $249,999	
___ $75,000 - $99,999	___ $250,000 - $299,999	

Comments and Suggestions

Please share any additional comments you might have about choosing a hotel for a business trip or about this survey (e.g. factors that influence hotel decisions, the number of hotel sets, etc.)

THANK YOU VERY MUCH FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE.

Appendix G

Calculation of Log likelihood Ratio Test Using Excel

- Criterion: Hypothesis 1a based on MNL

  A log-likelihood of Model 1: -3946

  A log-likelihood of Model 2: -3719

  Degree of freedom (Model 1): 4

  Degree of freedom (Model 2): 6

  Chi-square Critical value at the 0.05 significance level: 5.99

  -2LL = -2 (-3946 - (-3719)) = 454

Table 6.1 How to Perform the -2LL test Using Excel

A	B	C	D	E	F
Model	LL	DF	DF difference	-2LL function	Chi critical
Base model	-3946	4			
Estimated model	-3719	6	= C3-C$2	= -2*(B$2-B3)	5.99
Model	LL	DF	DF difference	-2LL function	Chi critical
Base model	-3946	4			
Estimated model	-3719	6	2	454	5.99